

ARITHMETIC
IN WHOLE AND BROKEN NUMBERS,
DIGESTED AFTER A
NEW METHOD,
AND CHIEFLY ADAPTED TO THE
TRADE OF IRELAND.

TO WHICH ARE ADDED
Instructions for Book-keeping:

WITH THE
Dignity of Trade in Great Britain and Ireland

EXTRACTED FROM
THE MERCANTILE LIBRARY: OR, COMPLEAT
ENGLISH TRADESMAN.

BY ELIAS VOSTER,
REVISED BY DANIEL VOSTER.

THE EIGHTEENTH EDITION,
Carefully revised by an eminent Arithmetician.

DUBLIN:
PRINTED BY RICHARD CROSS, No. 28,
BRIDGE-STREET.
1800

RB. 23.a. 6110



30-1-44

THE
P R E F A C E.

ALTHOUGH this Book be designed only for the Use of my *Scholars*, yet it will unavoidably fall into the Hands of others who are not; and since the Method I make Use of differs, in some Respect, from the common Way, I think it necessary to say something concerning it.

It contains such Questions in most of the Rules of Vulgar ARITHMETIC, as I have taught to my *Scholars* for many Years past; I say it contains only Questions with the Addition of a very few Directions about the Manner of working them: It being designed rather for a *Master* to teach by, than for a *Scholar* to learn by of himself: And those Questions are placed in such Order, that all that are of one Nature in their Operation, are contained in a distinct *Section* by themselves, with an *Example* at the Beginning of each *Section* to direct the *Learner*. and lead him on, as it were by the Hand, to the Resolution of every Question in it: The Ease this *Method* of *Proceeding* gives, and the great Service it does, both to *MASTER* and *SCHOLAR*, I have for many Years experienced.

I have thought it proper to place *Addition* of *Coin*, *Weight*, &c. after *Division*, because in my Opinion, it ought not to be learned until *Division* is well understood.

As for *Reduction*, since it is no absolute Rule of itself, but is either performed by Multiplication (*called Reduction descending*) or by Division (*called Reduction ascending*) or by both; the Use of my Rule of *Multiplication*, serves instead of the first, the Use of my *Division* instead of the second, and my *Reduction* of *English* and *Foreign Coin*, serves instead of the last: For there, both *Multiplication* and *Division* are made use of in each Question.

Some, it may be, will find fault with the great number of Questions contained in each Rule; but let them consider, that Youth do not learn so much by Apprehension as Exercise, which not only fixes the Rules of this *Art* upon their *Memories*, but by Degrees opens their *Judgment* to conceive the *Grounds* and *Reasons* of it; As for those among them that are more apprehensive than the Generality are, they are not obliged to work all the Questions contained in each *Section*, a few out of each will suffice.

ELIAS VOSTER
TABLES

T A B L E S

O F

COIN, WEIGHT AND MEASURE.

Of COIN.

1 Pound	}	Makes	{ 20 Shillings
1 Shilling			{ 12 Pence
1 Penny			{ 4 Farthings

Of TROY WEIGHT.

1 Pound	}	Makes	{ 12 Ounces
1 Ounce			{ 20 Penny wts.
1 Penny wt.			{ 24 Grains

Of AVOIR-DUPOIS WEIGHT.

1 Tun	}	Makes	{ 20 Hundred
1 Hundred			{ 4 Quarters or 112lb.
1 Quarter			{ 28 Pounds
1 Pound			{ 16 Ounces
1 Ounce			{ 16 Drams, or Drachms

Of DRY MEASURE.

1 Quarter	}	Makes	{ 8 Bushels
1 Bushel			{ 4 Pecks Land Measure
1 Peck			{ 2 Gallons (or 5 Water
1 Gallon			{ 2 Pottles
1 Pottle			{ 2 Quarts
1 Quart			{ 2 Pints

6. *Tables of Coins, Weights and Measures.*

Of Apothecaries Weight.

1 lb. Troy	} Makes	12 Ounces
1 Ounce		8 Drams
1 Dram		3 Scruples
1 Scruple		20 Grains

Of Liquid Measure.

1 Tun	} Makes	4 Hhds.
1 Hhd.		63 Gallons
1 Tierce		42 Gallons
1 Gallon		2 Pottles
1 Pottle		2 Quarts
1 Quart		2 Pints

Of Long Measure.

1 Mile	} Makes	8 Furlongs
1 Furlong		40 Perches or Poles
1 Perch		16½ Feet
1 Fathom		6 Feet
1 Ell		3 Feet 9 Inches
1 Yard		3 Feet
1 Foot		12 Inches
16½ Feet		1 Perch English
21 Feet		1 Perch Irish

1 Yard is 4 Quarters. 1 Quarter 4 Nails, or 5 Quarters an English Ell; and 3 Quarters make an Ell Flemish.

OF TIME.

1 Year hath 365 Days, except a Leap Year which hath 366 Days, and happens every Fourth Year; one Day and Night is 24 Hours; 1 Hour 60 minutes; 1 Minute 60 Seconds.

Thirty Days hath November.

April, June and September;

February Twenty-eight alone,

And each of the rest Thirty-one.

Note, Every Leap-Year, February hath Twenty-nine Days.

* These shew all the difference between English and Irish measure.

Explanations

*Explanation of Marks and Abbreviations of Words
made use of in this Book.*

l.	-	-	-	Pounds Sterling.
s.	-	-	-	Shillings.
d.	-	-	-	Pence
Ct.	-	-	-	Hundreds.
lb.	-	-	-	Pounds.
oz.	-	-	-	Ounces.
pw.	-	-	-	Penny-weights.
Gr.	-	-	-	Grains.
hhd.	-	-	-	Hogsheads.
gal.	-	-	-	Gallons
qt.	-	-	-	Containing.
No.	-	-	-	Number.
ps.	-	-	-	Pieces.
wt.	-	-	-	Weight.
pCt.	-	-	-	per Hundred.wt.

C H A P. I.

Of Notation and Numeration of whole Numbers.

S E C T. I.

NOTATION and NUMERATION teach how to write and value any Number composed of the following Characters, *viz.*

One, Two Three, Four, Five,

1, 2, 3, 4, 5,
Six, Seven, Eight, Nine, Cypher,
6, 7, 8, 9, 0.

Altho' a Cypher signifieth nothing by itself, yet being set to the Right Hand of any Figure, it increaseth its Value ten Times, and are read thus, *viz.*

Ten, Twenty, Thirty Forty, Fifty,

10, 20, 30, 40, 50,
Sixty, Seventy, Eighty, &c.
60, 70, 80.

If any two figures are set together, that which stands to the Right Hand, signifieth only itself, but that which stands to the Left Hand, signifieth its own Value ten Times, and are read thus, *viz.*

Fourteen, Twenty-five, Seventy-eight,

14, 25, 78,

Ninety-two.

92.

If three Figures stand together, that to the Right Hand signifieth itself, the Second, ten Times itself, and the Third, one hundred Times itself, and are read thus, *viz.*

137 *One Hundred and Thirty Seven,*

431 *Four Hundred Thirty One,*

646 *Six Hundred and Forty Six,*

875 *Eight Hundred Seventy Five.*

A Number

A number consisting of 4 Figures, as 4834, is thus read; Four Thousand Eight Hundred Thirty Four. A Number of five Figures, as 72368, is read thus; Seventy Two Thousand Three Hundred Sixty Eight.

As for Numbers consisting of more Figures, Observe the following Table.

1	Units	-	-	-	1
12	Tens	-	-	-	10
123	Hundreds	-	-	-	100
1234	Thousands	-	-	-	1000
12345	Ten Thousands	-	-	-	10000
123456	Hundred Thousands	-	-	-	100000
1234567	A Million	-	-	-	1000000
12345678	Ten Millions	-	-	-	10000000
123456789	Hundred Millions	-	-	-	100000000

—II.—

Questions to exercise Numeration.

How do you put down the following Numbers? viz.

One Hundred and Four	-	-	-	Answ. 104
One Hundred Twenty-three	-	-	-	"
Three Hundred Seventy-five	-	-	-	"
Four Hundred Ninety-one	-	-	-	"
Five Hundred Two	-	-	-	"
Six Hundred Seventy-eight	-	-	-	"
Eight Hundred Nine	-	-	-	"
Nine Hundred Sixty-two	-	-	-	"

—III.—

Of Numbers consisting of Four Figures.

Put down, viz.

One Thousand Two Hundred Thirty-five	-	-	-	Answ. 1235
Two Thousand Nine Hundred Seventy	-	-	-	"
Three Thousand Nine Hundred Eleven	-	-	-	"
Seven Thousand and Six	-	-	-	"

Eight

Eight Thousand Seven Hundred Seven -
 Five Thousand Seven Hundred Forty-three"
 Nine Thousand Thirty - - - "
 One Thousand One Hundred Eleven - "
 Two Thousand Seven Hundred Eleven - "

—IV.—

Of Numbers consisting of Five Figures.

How do you put down, viz.

Twenty Thousand Three Hundred	
Forty-five	<i>Answ.</i> 20345
Fifty one Thousand Sixty-seven	- - "
Sixty Thousand Four Hundred Eighty	
five	- - - "
Seventy Thousand and Twelve	- "
Eighty Thousand and Nine	- - "
Ninety-one Thousand Three Hundred	
Forty-seven	- - - "

—V.—

Of Numbers consisting of six Figures.

Write down, viz.

Two Hundred Thirty-four Thousand	
Five Hundred and Sixty-seven	<i>Answ.</i> 234567
Three Hundred Twenty-nine Thousand	
Seven Hundred Seventy-nine	- "
Seven Hundred Nine Thousand Eight	
Hundred Twelve	- - - "
Four Hundred Seventy-three Thousand	
One Hundred One	- - "
Eight Hundred Nine Thousand Seven-	
teen	- - - - - "
Nine Hundred Eighty-seven Thousand	
Six Hundred Fifty-four	- - - "

—VI.—

—VI.—

Of Numbers consisting of seven Figures

Put down, viz.

One Million, two Hundred forty seven
 Thousand three Hundred fifty six *Answ.* 1247356
 Three Millions fifty Thousand seven
 Hundred Eight - - - - -"
 Five Millions nine Thousand eight
 Hundred four - - - - -"
 Nine Millions seven Hundred four Thou-
 sand ninety-three - - - - -"
 Eight Millions five Hundred seventy Thou-
 sand six Hundred ninety-five - - -"

—VII.—

Of Numbers consisting of eight Figures.

Put down the following Sums, viz.

Ten Millions three Hundred ninety-
 seven Thousand four Hundred fifty-
 seven - - - - - *Answ.* 10397457.
 Seventy-nine Millions two Hundred forty
 Thousand six Hundred - - - - -"
 Fifty-seven Millions eight Thousand four
 Hundred thirty-seven - - - - -"
 Sixty-eight Millions nine Hundred seven
 Thousand thirty-two - - - - -"
 Forty Millions one Hundred eleven
 Thousand one Hundred one - - -"

Put down,

One Hundred twenty three Millions }
 four Hundred fifty-six Thousand }
 even Hundred eighty-nine - - - }

C H A P. II.
A D D I T I O N.
S E C T. I.

ADDITION teacheth to add two or more Sums together, to make them one Total.
Add the following Sums together, viz.

236	2486	3956	4576	4674
644	2355	7943	1697	7998
457	7667	8360	4309	3975
1337				
8963	9658	7539	4268	2873
3008	5732	9731	2646	9008
5769	9061	1579	3520	6524
6843	2367	5237	6482	1218
9017	8254	9795	8264	2627
7503	5378	1793	6428	8344
4830	8763	66312	576895	6768973
2970	6978	70603	79865	8970625
2795	9689	80492	93784	6276942
3962	5442	32109	6789	9756879
9874	3070	9875	3997	0319431
8237	9010	979	985	2137540
784	2989	29	5796	5967389
7963	4568	311	4796	4832518
7475	3456	4587	3210	4839518
428	4357	64338	7826	8763649
987	2114	4828	5937	2198754
274	9803	87630	78989	9763475

—II.—

The Use of ADDITION.

1. How much is 1080l. 3234l. 4283l. and 2325l. together *Answ.* 10922l.

Example.

£.1080
3234
4283
2325

Answ. £.10922

2. A Merchant is indebted to a A. 1500l. to B. 408l. to C. 1310l. to D. 50l. and to E. 1900l. I demand the whole Debt? *Answ.* 5168l.

3. A Merchant has received the following Sums, 200l. 315l. 317l. 10l, 172l. 513l. and 9l. I demand the total Sum? *Answ.* 1536l.

4. A Merchant has bought 7 Casks of Merchandizes, No. 1, weighed 310lb. No. 2, 420lb. No. 3, 338lb. No. 4, 335lb. No. 5, 400lb. No. 6, 412lb. and No. 7, 429lb. I demand how many Pounds they weigh together? *Answ.* 2644lb.

5. What is the total Weight of these nine Casks of Merchandise, viz. No. 1, 2, 3, weighed each 350lb. No. 4 and 5, weighed each 331lb. No 6, weighed 310lb. No. 7, 8 and 9, weighed each 342lb? *Answ.* 3048lb.

6. A Merchant paid the following Sums, viz. 5000l. 2040. 1320l. 1100l. and 9070l. I demand the whole Sum? *Answ.* 18530l.

B

7 A.

7. A Linen Draper sold 10 Pieces of Cloth, the first contained 34 Yards, the second, third, fourth and fifth, contained each 36 Yards. The sixth, seventh and eighth, contained each 33 Yards, and the ninth and tenth Pieces contained each 35 Yards. How many Yards are they together?
Answ. 347 Yards.

8. A Cashier received 6 Bags of Money, the first holds 1034l. the second 1025l. the third 2008l. the fourth 7013l. the fifth 5075l. and the last holds 89l. How much is the whole Sum received?
Answ. 16244l.

9. A Vintner buys 6 Pipes of Brandy, containing as follows, viz. 120 Gallons, 118, 125, 121, 127 and 119 Gallons. How many Gallons in the whole? *Answ.* 730 Gallons.

10. What is the total Weight of these seven Casks of Merchandises, viz. No. 1, weighed 96clb. No. 2, 725lb. No. 3, 830lb. No. 4, 798lb? No. 5, 697lb. No. 6, 569lb. and No. 7, 987lb?
Answ. 5566lb.

11. If for one Penny I can buy 10 Eggs, how many can I buy for 40d. *Answ.* 400 Eggs.

12. How much is nine Times one Hundred and thirty-five? *Answ.* 1215.

13. A Merchant bought 3 Tons of Butter at 20l. per Ton, and 7 Tons of Tallow, at 40l. per Ton. How much doth both the Butter and Tallow come to? *Answ.* 340l.

14. How much is 3 Times 9, 4 Times 50, and twice 170lb. *Answ.* 567lb.

15. Add

15. Add 3 Times 303, 6 Times 909, 4 Times 505 and 5 Times 2021. ? *Answ.* 9393lb.

16. If 1 Ton of Merchandize cost 39l. what will 20 Tons come to ? *Answ.* 780lb,

17. Add twice 397, three Times 794, four Times 3176, five Times 15880, six Times 95280 and once 333040 ? *Answ.* One Million.

18. How many Days are there in a Year, allowing for the Months of April, June, September and November 30 Days each, for February 28, and the other Months each 31 Days. ? *Answ.* 365 Days.

19. What Day of the Year was the 11th Day of May 1724, it being Leap Year ? *Answ.* The 132nd Day.

20. Anno 1715 being a common Year, I demand what Day of the Year the 22nd Day of April was ? *Answ.* The 112th Day.

CHAP. III. MULTIPLICATION.

SECT. I.

MULTIPLICATION serves instead of many ADDITIONS, and teaches how, by two Numbers given, to find a third which shall contain either of the given Terms, so often as the other of them has Units.

MULTIPLICATION TABLE.

2 Times	{	2 are 4	5 Times	{	5 are 25
		3 - 6			6 = 30
		4 = 8			7 = 35
		5 = 10			8 = 40
		6 = 12			9 = 45
		7 = 14			
		8 = 16			
		9 = 18			
3 Times	{	3 = 9	6 Times	{	6 = 36
		4 = 12			7 = 42
		5 = 15			8 = 48
		6 = 18			9 = 54
		7 = 21			
		8 = 24			
		9 = 27			
4 Times	{	4 = 16	7 Times	{	7 = 49
		5 = 20			8 = 56
		6 = 24			9 = 63
		7 = 28			
		8 = 32			
		9 = 36			
4 Times	{	4 = 16	8 Times	{	8 = 64
		5 = 20			9 = 72
		6 = 24			
		7 = 28			
		8 = 32			
		9 = 36			
4 Times	{	4 = 16	9 Times	{	9 = 81
		5 = 20			Multiply
		6 = 24			
		7 = 28			
		8 = 32			
		9 = 36			

Multiplication.

17

Multiply the following Sums, viz.

6298	79659	890659	7998459
by 4	5	6	7
25192			

I — II. —

Multiply 65436
by 24

261744
130872

Ans. 1570464

Note, To prove Multiplication, multiply half the Multiplicand by double the Multiplier: or, half the Multiplier, by double the Multiplicand.

Multiply the following Sums, viz.

479865	9875978	98320064
by 36	76	94

— III. —

Multiply 9832064
by 324

39328256
19664128
29496192

Ans. 3185588736
B 3

Multiply

*Multiplication.**Multiply the following Sums, viz.*

$$\begin{array}{r} 3987547 \\ \text{by } 716 \\ \hline \end{array}$$

$$\begin{array}{r} 9875496 \\ 627 \\ \hline \end{array}$$

$$\begin{array}{r} 4287219 \\ 574 \\ \hline \end{array}$$

—IV.—

$$\begin{array}{r} \text{Multiply } 6504039 \\ \text{by } 9804 \\ \hline \end{array}$$

$$\begin{array}{r} 26016156 \\ 520323120 \\ 58536351 \\ \hline \end{array}$$

Answ. 63765598356*Multiply the following Sums, viz.*

$$\begin{array}{r} 63001795 \\ \text{by } 986005 \\ \hline \end{array}$$

$$\begin{array}{r} 94065459 \\ 70408 \\ \hline \end{array}$$

$$\begin{array}{r} 54306703 \\ 8016079 \\ \hline \end{array}$$

—V.—

*How much is 100 Times 21763?**Example.*

$$\begin{array}{r} 21763 \\ 100 \\ \hline \end{array}$$

Answ. 2176300*Multiply the following Sums, viz.*

$$\begin{array}{r} 97648 \\ \text{by } 93100 \\ \hline \end{array}$$

$$\begin{array}{r} 38765 \\ 725000 \\ \hline \end{array}$$

$$\begin{array}{r} 78453 \\ 8790000 \\ \hline \end{array}$$

—VI.

—VI.—

The Use of Multiplication.

N O T E.

Of Coin	{	Pounds multiplied by 20 are Shillings.
		Shillings multiplied by 12 are Pence.
		Pence multiplied by 4 are Farthings.
Of Avoir-du-Weight.	{	Tuns multiplied by 20 are Hundreds.
		Hundreds multiplied by 4 are Quarters.
		Quarters multiplied by 28 are Pounds.
		Pounds multiplied by 16 are Ounces.
		Ounces multiplied by 16 are Drams.
Of Troy Weight.	{	Pounds Troy multiplied by 12 are Ounces.
		Ounces multiplied by 20 are Penny Weights.
		Penny Wts. multiplied by 24 are Grains.
Of Liquid Measure.	{	Tuns multiplied by 4 are Hhds.
		Hogsheads multiplied by 63 are Gallons.
		Gallons multiplied by 2 are Pottles.
		Pottles multiplied by 2 are Quarts.
		Quarts multiplied by 2 are Pints.
		Pints multiplied by 4 are Naggins.
Of Dry Measure.	{	Barrels multiplied by 4 are Bushels.
		Bushels multiplied by 4 are Pecks.
		Pecks multiplied by 2 are Gallons.
		Gallons multiplied by 2 are Pottles.
Of Time.	{	Years multiplied by 365 are Days.
		Days multiplied by 24 are Hours.
		Hours multiplied by 60 are Minutes.
		Minutes multiplied by 60 are Seconds.

Of

Of Long
Measure.
Of Apotheca-
ries Weight.

Miles multiplied by 8 are Furlongs.
Furlongs multiplied by 40 are Perches.
Perches multiplied by $16\frac{1}{2}$ are Feet.*
Feet multiplied by 12 are Inches.

Ounces Troy multiplied by 8 are Drams.
Drams multiplied by 3 are Scruples.
Scruples multiplied by 20 are Grains.

1. How many Pence in 1944 Shillings?

Example.

$$\begin{array}{r} 1944s. \\ 12 \\ \hline 3888 \\ 1944 \\ \hline \end{array}$$

Answ. 23328d.

2. How many Shillings are in 1395 Pounds?

Answ. 27900 Shillings.

3. In 2480 Pence how many Farthings? *Answ.* 9920 Farthings.

4. At 12 Plums a Penny, how many for a Sixpence? *Answ.* 72.

5. How many Hours are in 365 Days? *Answ.* 8760 Hours.

6. In 112lb. Avoir-du-pois, how many Ounces? *Answ.* 1792 Ounces.

7. How

* English Perches.

7. How much will 245 Tons of Butter come to at 25l. a Tun? *Answ.* 6125l.

8. If one Pound of Raisins cost 4 pence, how much will 112lb. cost? *Answ.* 448d.

9. How many Minutes are in 24 Hours? *Answ.* 1440 Minutes.

10. In 1440 Minutes how many Seconds? *Answ.* 86400 Seconds.

11. If 3 Eggs cost a Halfpenny, how many for one Shilling? *Answ.* 72 Eggs.

12. How many Pence are in 100 Cobbs, at 57d. each? *Answ.* 5700d.

13. In 200 Guineas of 23s. each, how many Shillings? *Answ.* 4600s.

14. If one Crown is 65d how many Pence are there in 633 Crowns? *Answ.* 41145d.

15. How many Gallons are in 264 Hhds. at 63 Gall. per Hhd.? *Answ.* 16632.

—VII.—

16. How many Pence are in 359l.

Example.

$$\begin{array}{r}
 359\text{l.} \\
 20 \\
 \hline
 718\text{os.} \\
 12 \\
 \hline
 14360 \\
 7180 \\
 \hline
 \end{array}$$

Answ. 86160d.

17. In 65 Tuns of Brandy how many Gallons ?
Answ. 16380.

18. How many Penny-weights are in 100lb, Troy ? *Answ.* 24000.

19. In Twenty Years how many Hours ? *Answ.* 175200.

20. How many Pence are in 1000l. *Answ.* 240000.

21. In 2986 Shillings how many Farthings ?
Answ. 143328.

22. How many Ounces are in 852 Ct. Avoir-du-pois Weight ? *Answ.* 1526784.

—VIII.

—VIII.—

23. How many Quarts are in 70 Tuns of Brandy?

$$\begin{array}{r}
 70 \text{ Tuns} \\
 4 \\
 \hline
 280 \text{ Hhds.} \\
 63 \\
 \hline
 840 \\
 1680 \\
 \hline
 17640 \text{ Gal.} \\
 4 \\
 \hline
 \end{array}$$

Answ. 70560 Quarts.

24. How many Minutes are in 1709 Years?
Answ. 898250400 Minutes.

25. In 978l. how many Farthings? *Answ.* 938880 Farthings.

26. How many Grains are in 20lb. of Silver?
Answ. 115200 Grains,

27. In 100 Years how many Seconds? *Answ.* 3153600000 Seconds.

28. How many Farthings are in 897 Guineas of 23s. each? *Answ.* 990288.

29. How many Feet are in one English Mile?
Answ. 5280.

30. How

30. How many Feet are there from Dublin to Cork, supposing their distance 100 Miles? *Answ.* 528000 Feet.

31. How many Inches would reach round the Earth, its Circumference being 360 Degrees, and each Degree 60 Miles? *Answ.* 1368576000.

—IX.—

32. How many Pence are in 18s. 6d. *Answ.* 222d.

s. d.

18 : 6

12

42

18

Answ. 222d.

33. How many Shillings are in 105l. 18s. ?
Answ. 2118s.

34. In 7l. 13s. how many Pence? *Answ.* 1836d.

35. How many lb. are in 75 Ct. 3qrs. ? *Answ.* 8484lb.

36. In 145 Ct. 2 qrs, 25lb. how many lb. ?
Answ. 16321lb.

37. In one Hundred and seven Pounds ster and 11 Pence, how many Pence? *Answ.* 25691d.

38. How many Gallons are in 36 Tuns, 3 Hhds. and 27 Gallons ? *Answ.* 9288 Gallons.

39 In.

39. In 46 Years, 21 Days, 8 Hours, and 59 Minutes, how many Minutes? *Answ.* 24208379.

—X.—

40. How many pence are in 500 Pistoles of 18s. 6d. each?

Example.

	s.	d.
500 at	18	6
222	12	
Answ. 111000	42	
	18	
	222d.	

41. In 609 Pieces of 3s. 10¹/₂d. how many Half-pence? *Answ.* 56637.

42. How many Half-pence are in 396 Pieces of 4s. 7¹/₂d.? *Answ.* 43956.

43. If 1 Piece is 5s. 10¹/₂d. how many Half-pence are there in 896 such pieces? *Answ.* 126336.

44. How many Pence are in 987 Pieces of 3s. 4d. each? *Answ.* 39480.

45. In One thousand one hundred and eleven Pieces of 3s. 10¹/₂d. how many Half-pence? *Answ.* 103323.

46. How many lb. are in 16 Casks, each 2 Ct. 3qrs. 14lb.?

C

Example

*Multiplication.**Example.*

Ct. qrs. lb.

2 : 3 : 14,

4

11 qrs.

28

92

23

322lb. in one Cask.

16

1932

322

Answ. 5152lb.

47. In 24 Bags, each 4 Ct. 1 qr. 16lb. how many lb.? *Answ.* 11808.

48. In 10 Bags, each 300 Crowns, and each Crown 5s. 5d. I demand how many Pence? *Answ.* 195000.

49. In Fifty heaps of Pistoles, and 20 in a Heap, each Pistole 18s. 6d. how many Pence?—
Answ. 222000.

50. How many Sparrows, 10 for one Penny, would pay for an Horse worth 20l.? *Answ.* 48000.

CHAP. IV.

SUBTRACTION.

SECT. I.

SUBTRACTION teacheth to take a less Number from a greater, and to know what remains.

From	8103	1969	1917	1540
Take	<u>4193</u>	<u>1408</u>	<u>1718</u>	<u>1460</u>
Remain	<u>3910</u>			
Proof	8103			

From	6119889	4090987	6278505
Take	<u>3599907</u>	<u>1989849</u>	<u>1434040</u>
Remain			
Proof			

From	69740167523	78000330402
Take	<u>23420891075</u>	<u>53298495269</u>
Remain		
Proof		

—II.—

OF COIN.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
Received	1095	19	10	979	15	11
Paid	134	15	08	200	19	11
Remain	964	04	02			
Proof	1098	19	10			

	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
Received	9975	02	03	8500	19	07
Paid	7869	19	11	985	18	09
Remain						
Proof						

	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
Received	1000	19	09 $\frac{1}{4}$	4351	17	10 $\frac{1}{2}$
Paid	999	09	11 $\frac{1}{2}$	2359	19	11 $\frac{3}{4}$
Remain						
Proof						

	<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
Received	14932	19	10	3687	16	06 $\frac{1}{2}$
Paid	14768	17	09 $\frac{1}{2}$	1459	17	07 $\frac{3}{4}$
Remain						
Proof						

—III.

—III.—

OF AVOIR-DU-POIS WEIGHT.

	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>		<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
Bought	200	: 2	: 26		275	: 2	: 15
Sold	99	: 3	: 15		27	: 2	: 07
Remain	100	: 3	: 11				
Proof	200	: 2	: 26				

	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>		<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
Bought	6040	: 1	: 21		1937	: 0	: 00
Sold	1908	: 3	: 27		899	: 3	: 27
Remain							
Proof							

	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>		<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
From	8340	: 2	: 03		9674	: 3	: 25
Take	1090	: 3	: 16		9074	: 3	: 25
Remain							
Proof							

	<i>Tun.</i>	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>		<i>Tun.</i>	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
Bought	6904	: 16	: 3	: 11		7650	: 10	: 0	: 13
Sold	987	: 14	: 0	: 27		5879	: 10	: 3	: 25
Remain									
Proof									

—IV.—

OF LIQUID MEASURE.

	<i>Tuns. Hhd. gal.</i>	<i>Tuns. Hhd. gal.</i>
Bought	31 : 3 : 15	54 : 0 : 27
Sold	29 : 2 : 26	21 : 3 : 42
Remain	2 : 0 : 52	
Proof	31 : 3 : 15	

	<i>Tuns. Hhd. gal.</i>	<i>Tuns. Hhd. gal.</i>
Bought	304 : 0 : 54	721 : 1 : 33
Sold	100 : 3 : 54	247 : 1 : 11
Remain		
Proof		

—V.—

OF TROY WEIGHT.

	<i>lb. oz. pw. gr.</i>	<i>lb. oz. pw. gr.</i>
Bought	554 : 9 : 19 : 23	946 : 00 : 00 : 01
Sold	97 : 0 : 17 : 15	195 : 11 : 17 : 23
Remain	457 : 9 : 2 : 08	
Proof	554 : 9 : 19 : 23	

lb.

	<i>lb.</i>	<i>oz.</i>	<i>pw.</i>	<i>gr.</i>	<i>lb.</i>	<i>oz.</i>	<i>pw.</i>	<i>gr.</i>
Bought	304	: 11	: 15	: 14	917	: 0	: 14	: 09
Sold	196	: 10	: 19	: 21	798	: 9	: 18	: 17
Remain								
Proof								

—VI.—

Other Questions proper to this RULE, are such as follow :

1. A Merchant bought 600 falt Ox Hides, weighing 561 Ct. oqrs. 2lb. of which he sells 250 Hides, weighing 239 Ct. 3qrs. 2 $\frac{1}{2}$ lb. I demand how many Hides, he has left, and what they weigh?—
Anfw. 350 Hides, weighing 321 Ct. oqrs. 5lb.

Example.

	Hides.	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
Bought	600qt.	561	: 0	: 02
Sold	250qt.	239	: 3	: 25
Remain	350qt.	321	: 0	: 05

2. A Shop-keeper bought a Piece of Cloth, qt. 42 Yards, for 22l. 10s, of which he sells 27 Yards for 15l. 15s. I demand how many Yards he has left, and what they stand him in? *Anfw.* 15 Yards, and cost him 6l. 15s.

3. What number is it which being added to 9709, makes 10901? *Anfw.* 1192.

4. A Mer-

4. A Merchant has 209 Casks of Butter, weighing 400Ct. 2qrs. 14lb. ships off 173 Casks of the said Butter, weighing 213 Ct. 2qrs. 27lb. I demand how many Casks he has left, and their Weight? *Ans.* 36 Casks, qt. 185 Ct. 3qrs. 15lb.

5. A Vintner bought 20 Pipes of Brandy, qt. 2459 Gallons, and sells 14 Pipes, qt. 1680 Gallons, how many Pipes and Gallons has he unfold? *Ans.* 6 Pipes, qt. 779 Gallons.

6. A Merchant bought 564 tanned Hides, weighing 16800lb. sells thereof 260 Hides, Weight 7809lb. how many hides has he unfold, and what do they weigh? *Ans.* 304 Hides, qt. 8991lb.

7. Suppose *Cork*, *Clonmel*, and *Dublin* lie in a straight Line, and the Distance between *Cork* and *Dublin* is 100 Miles, and from *Cork* to *Clonmel* is 30 Miles, I demand the Distance between *Clonmel* and *Dublin*? *Ans.* 70 Miles.

8. How long is it since the happy Revolution, which happened in the Year, 1688, we are now in the Year 1789? *Ans.* 101 Years.

9. What time is there between the Eclipse which happened in the Year, 1715, the 22d Day of April, 30 Minutes past 7, in the Morning, and the Eclipse which happened in the Year 1724, the 11th of May, at 9 Minutes past 5 in the Afternoon? *Ans.* 9 Years, 20 Days, 9 Hours, 39 Minutes.

CHAP. V.

D I V I S I O N.

S E C T. I.

DIVISION teacheth to find how often one Number is contained in another, or how to divide a Number, into as many equal parts as you please.

How often goes 2 into 4398? *Answ.* 2199 Times.

Example.

$$\begin{array}{r} \text{2199} \\ 4398 \\ \underline{2222} \end{array} \left\{ \begin{array}{l} 2199 \\ 2 \end{array} \right.$$

Proof 4398

Divide the following Sums.

80830368 by 3		23343958 by 7
20029292 by 3		99900637 by 8
98763805 by 5		96783994 by 9
23343954 by 6		82055603 by 7

—II.—

How many Times goes 12 into 31589? *Answ.* 2632 Times and 5 over.

Example.

Example.

$$\begin{array}{r}
 732(5 \\
 31589 \\
 12222 \\
 \hline
 211
 \end{array}
 \left.
 \begin{array}{l}
 \\
 \\
 \\
 \end{array}
 \right\}
 \begin{array}{l}
 2632 \text{ and } 5 \text{ over.} \\
 12
 \end{array}$$

$$\begin{array}{r}
 5269 \\
 2632 \\
 \hline
 \end{array}$$

Proof 31589

Divide the following Sums, viz.

3970478 by 24		8279860 by 54
2725924 by 36		7805438 by 63
6782329 by 48		6758247 by 89
8207603 by 76		1976392 by 82

— III. —

Divide 3185588940 by 324, comes 9832064, and 204 over.

Example.

$$\begin{array}{r}
 22(2 \\
 106203(0 \\
 26936090(4 \\
 3185588940 \\
 324444444 \\
 \hline
 3222222 \\
 88888
 \end{array}
 \left.
 \begin{array}{l}
 \\
 \\
 \\
 \end{array}
 \right\}
 \begin{array}{l}
 9832064 \\
 324
 \end{array}$$

$$\begin{array}{r}
 39328260 \\
 19664128 \\
 29496194 \\
 \hline
 \end{array}$$

Proof 3185588940

Divide the following Sums, viz.

87245229 by 432		9453673 by 793
86090373 by 592		2597906 by 967
23390373 by 797		9760965 by 796

653096439 by 7627		274109470 by 69327
269272099 by 7436		906790422 by 64369
903606321 by 5996		490222492 by 73223

—IV.—

Divide 36754 by 100.

Example.

$$\begin{array}{r} 367(54) \\ \times 100 \\ \hline \end{array}$$
 367 and 54 over.

Divide the following Sums, viz.

2309723 by 2000		3222200 by 1000
9060392 by 3000		2396027 by 7000
6904029 by 5000		1324902 by 9000

—V.—

The Use of DIVISION.

Of Coin { NOTE, Farthings divided by 4 are Pence.
 Of Coin { Pence divided by 12 are Shillings.
 Of Coin { Shillings divided by 20 are Pounds.

Of Troy Weight. { Grains Troy, divided by 24 are Penny Wts.
 Of Troy Weight. { Penny Weights divided by 20 are Ounces
 Of Troy Weight. { Ounces divided by 12 are Pounds.

Of Avoir-du-pois Weight. { Drams avoirdupois, divided by 16 are Ounces
 Of Avoir-du-pois Weight. { Ounces divided by 16 are Pounds.
 Of Avoir-du-pois Weight. { Pounds divided by 28 are Quarters.
 Of Avoir-du-pois Weight. { Quarters divided by 4 are Hundreds.
 Of Avoir-du-pois Weight. { Hundreds divided by 20 are Tuns.

Of Dry Measure. { Pints divided by 2 are Quarts.
 Of Dry Measure. { Quarts divided by 2 are Pottles.
 Of Dry Measure. { Pottles divided by 2 are Gallons.
 Of Dry Measure. { Gallons divided by 2 are Pecks.
 Of Dry Measure. { Pecks divided by 4 are Bushels.
 Of Dry Measure. { Bushels divided by 4 are Barrels.

Of

Of Apothecaries Weight. { Grains Troy, divided by 20 are Scruples.
 Scruples divided by 3 are Drams.
 Drams divided by 8 are Ounces.
 Ounces divided by 12 are Pounds.

Of Liquid Measure. { Naggins divided by 4 are Pints.
 Pints divided by 2 are Quarts.
 Quarts divided by 2 are Pottles.
 Pottles divided by 2 are Gallons.
 Gallons divided by 63 are Hogsheads.
 Hhds. divided by 4 are Tuns.

Of Time. { Seconds divided by 60 are Minutes.
 Minutes divided by 60 are Hours.
 Hours divided by 24 are Days.
 Days divided by 365 are Years.

1. How many Pence are in 1008 Farthings?
Answ. 252 Pence.

Example.

$$\begin{array}{r} 2 \\ 200\cancel{0}\cancel{0} \\ \hline 444 \end{array} \left\{ \begin{array}{l} 252 \end{array} \right.$$

2. How many Shillings are in 7776 Pence?
Answ. 648 Shillings.

3. In 109080 Shillings, how many Pounds Sterling? *Answ.* 5454l.

4. How many Crowns are in 12111 Pence, each Crown at 65 Pence? *Answ.* 186 Crowns, and 21d.

5. In 85400 Pence, how many Ducatoons of 72d. each? *Answ.* 1186 Ducatoons and 8d. over.

6. How many Guineas of 23s. each, could one have for 1009800 Shillings? *Answ.* 43904 Guineas, and 8s. over.

7. In

7. In 107520 Ounces of Avoirdupois Weight, how many lb. ? *Answ.* 6720lb.

8. How many Pounds are in 20196 Ounces Troy Weight ? *Answ.* 1683lb.

9. In 20658 Gallons, how many Hogheads ? *Answ.* 327 Hogheads, and 57 Gallons over.

10. How many Days are in 8760 Hours ? *Answ.* 365 Days.

11. How many Cobbs of 57d. each, are equal to 57000d. ? *Answ.* 1000.

—VI.—

12. In 16320lb. of Beef, how many hundred Weight ? *Answ.* 145 Ct. 2 qrs. 24lb.

$$\begin{array}{rcl}
 & (2 & \\
 288(4) & \left. \begin{array}{l} 16320 \\ 288 \\ 22 \end{array} \right\} & \begin{array}{l} 12(2) \\ 582 \\ 444 \end{array} \left\{ \begin{array}{l} \text{Ct. qrs. lb.} \\ 145 : 2 : 24 \end{array} \right.
 \end{array}$$

13. How many Pounds Sterling are in 86248 Pence ? *Answ.* 359l. 7s. 4d.

14. How many Tuns of Wine are in 6965 Gallons ? *Answ.* 27 Tuns, 2 Hogheads, and 35 Gallons.

15. In 340480 Ounces of Avoirdupois, how many Hundred Weight ? *Answ.* 190 Ct.

16. How many years are in 175280 Hours ? *Answ.* 20 Years, 3 Days, 8 Hours.

17. In 115200 Grains, how many lb. Troy Weight ? *Answ.* 20lb.

—VII.—

18. If one Yard of Cloth cost 5s. how many Yards can I buy for 7500s.? *Answ.* 1500 Yards.

Example.

$$\begin{array}{r} 2 \\ 7500 \\ 5000 \\ \hline 2500 \end{array} \left. \vphantom{\begin{array}{r} 2 \\ 7500 \\ 5000 \\ \hline 2500 \end{array}} \right\} 1500$$

19. If 1500 Yards of Cloth cost 7500s. what costs one Yard? *Answ.* 5s.

20. How many tuns of Brandy can be bought for 2880l. at 60l. the Tun? *Answ.* 48 Tuns.

21. If a Journeyman earns 520s. in a Year how much is it a Week? *Answ.* 10s.

22. How many Hogheads of Wine can I buy for 972l. if one Hhd. cost 9l. *Answ.* 108 Hhds.

23. If 108 Hogheads of Wine cost 972l. what will one Hhd. come to? *Answ.* 9l.

24. If in one Week I spend 9s. in what Time can I spend 468s.? *Answ.* in 52 Weeks.

25. How much is a Tun of Tallow worth, if 294 Tuns cost 8526l.? *Answ.* 29l.

—VIII.—

26. If 3024l. were to be divided between 5 Persons, what would each Man's Share be? *Answ.* 604l. 16s.

Example.

$$\begin{array}{r} (4) \\ 3024 \\ 5000 \\ \hline 20 \end{array} \left. \vphantom{\begin{array}{r} (4) \\ 3024 \\ 5000 \\ \hline 20 \end{array}} \right\} 604l. \text{ and } 4 \text{ over.}$$

$$\begin{array}{r} 20 \\ \hline 80 \\ 80 \\ \hline 0 \end{array} \left. \vphantom{\begin{array}{r} 20 \\ \hline 80 \\ 80 \\ \hline 0 \end{array}} \right\} 16s.$$

27. Sup-

27. Suppose 1406l. were to be divided between 8 Persons, what would each Man's part be? *Answ.* 175l. 15s.

28. Divide 622l. between 6 Persons, and it comes to 103l. 13s. 4d. for each.

29. What is each Man's Share, if 270l. were to be divided between 8 Persons? *Answ.* 33l. 15s.

30. Divide 1224l. between 320 Men, and it comes to 3l. 16s. 6d. each.

31. Divide 3l. between 16 Persons, and how much does it come to for each? *Answ.* 3s. 9d.

CHAP. VI:

ADDITION OF COIN.

SECT. I.

<i>l.</i>	<i>s.</i>	<i>d.</i>	<i>l.</i>	<i>s.</i>	<i>d.</i>
710	: 11	: 06	516	: 14	: 08
612	: 14	: 03	724	: 17	: 09
419	: 15	: 07	319	: 18	: 06
1743	: 01	: 04			

Addition of Coin.

<i>l.</i>	<i>s.</i>	<i>d.</i>
206	: 02	: 08
1090	: 02	: 08
984	: 12	: 03
442	: 13	: 09
663	: 11	: 09

<i>l.</i>	<i>s.</i>	<i>d.</i>
135	: 17	: 07
193	: 10	: 11
1213	: 13	: 00
319	: 19	: 07
1000	: 04	: 11
96	: 16	: 06
118	: 09	: 09
976	: 13	: 10
549	: 12	: 06

<i>l.</i>	<i>s.</i>	<i>d.</i>
999	: 18	: 01
808	: 17	: 10
777	: 18	: 01
666	: 16	: 09
555	: 15	: 08
677	: 13	: 07
333	: 12	: 06
738	: 11	: 05
314	: 10	: 01
331	: 19	: 03
113	: 17	: 01
174	: 13	: 10
751	: 12	: 09

<i>l.</i>	<i>s.</i>	<i>d.</i>
1237	: 03	: 01
127	: 19	: 11
371	: 14	: 03
1028	: 17	: 09
799	: 17	: 05

<i>l.</i>	<i>s.</i>	<i>d.</i>
943	: 19	: 07
21	: 11	: 06
308	: 18	: 04
1008	: 11	: 04
153	: 12	: 09
383	: 13	: 07
1009	: 14	: 06
935	: 13	: 09
796	: 17	: 06

<i>l.</i>	<i>s.</i>	<i>d.</i>
1779	: 18	: 01
808	: 19	: 11
909	: 16	: 11
1851	: 17	: 10
765	: 17	: 02
683	: 10	: 04
1899	: 11	: 05
651	: 13	: 04
1351	: 15	: 08
235	: 16	: 06
1065	: 12	: 03
932	: 13	: 02
1166	: 14	: 08

Addition of Coin.

41

<i>l.</i>	<i>s.</i>	<i>d.</i>
965	: 19	: 11
876	: 17	: 09
742	: 10	: 01
967	: 19	: 10
434	: 14	: 11

<i>l.</i>	<i>s.</i>	<i>d.</i>
698	: 18	: 02
873	: 01	: 09
175	: 12	: 03
789	: 14	: 06
969	: 10	: 06

<i>l.</i>	<i>s.</i>	<i>d.</i>
875	: 18	: 06 $\frac{1}{2}$
1020	: 17	: 08
781	: 12	: 08 $\frac{3}{4}$
897	: 18	: 10
1758	: 15	: 08 $\frac{1}{4}$
585	: 10	: 10
1679	: 14	: 10 $\frac{1}{2}$
898	: 17	: 07
1099	: 16	: 09 $\frac{3}{4}$

<i>l.</i>	<i>s.</i>	<i>d.</i>
1007	: 17	: 07 $\frac{1}{2}$
482	: 19	: 08
1829	: 17	: 10 $\frac{3}{4}$
996	: 15	: 08
2534	: 18	: 05 $\frac{1}{2}$
724	: 14	: 04
1654	: 11	: 04 $\frac{3}{4}$
607	: 17	: 03
1596	: 14	: 07 $\frac{1}{2}$

<i>l.</i>	<i>s.</i>	<i>d.</i>
1695	: 18	: 03
4304	: 17	: 09
3957	: 10	: 11
3169	: 16	: 02
6201	: 16	: 02
6396	: 10	: 09
9850	: 13	: 03
2096	: 10	: 06
3329	: 19	: 06
3985	: 04	: 02
6302	: 16	: 10
9108	: 19	: 09
2399	: 19	: 09
6554	: 12	: 09

<i>l.</i>	<i>s.</i>	<i>d.</i>
9790	: 17	: 10 $\frac{1}{2}$
7549	: 18	: 07
9054	: 15	: 10 $\frac{1}{2}$
9162	: 09	: 09
9952	: 12	: 03 $\frac{1}{4}$
2609	: 10	: 06
3796	: 14	: 06 $\frac{3}{4}$
9984	: 15	: 06 $\frac{1}{2}$
9865	: 07	: 10
7996	: 16	: 07
6923	: 18	: 06 $\frac{1}{2}$
9162	: 15	: 01
6307	: 19	: 10 $\frac{1}{4}$
1399	: 17	: 11

<i>l.</i>	<i>s.</i>	<i>d.</i>
1036821	: 15 :	11 $\frac{1}{2}$
10920	: 17 :	04
1032	: 19 :	08 $\frac{3}{4}$
50233	: 16 :	04 $\frac{1}{2}$
1006	: 13 :	02
102021	: 17 :	04 $\frac{1}{4}$
2071099	: 18 :	10
104	: 12 :	06 $\frac{1}{4}$
503019	: 08 :	00 $\frac{1}{4}$
50017	: 15 :	02
1188	: 10 :	03
106	: 18 :	06 $\frac{1}{2}$
9886	: 17 :	11
50099	: 03 :	08 $\frac{3}{4}$
170066	: 18 :	02
11277	: 17 :	06 $\frac{3}{4}$
6006	: 08 :	08 $\frac{1}{4}$
4127	: 05 :	04
2239	: 03 :	10 $\frac{3}{4}$
44202	: 15 :	09
3222	: 12 :	07 $\frac{1}{2}$
172310	: 16 :	06
16230	: 17 :	03
1726	: 15 :	10
15	: 13 :	05 $\frac{1}{4}$
200925	: 18 :	08

<i>l.</i>	<i>s.</i>	<i>d.</i>
18101035	: 15 :	04
15173260	: 18 :	03 $\frac{1}{4}$
17121960	: 14 :	06
1218139	: 18 :	06 $\frac{1}{4}$
154188	: 13 :	07 $\frac{3}{4}$
176099	: 09 :	11
136933	: 17 :	10 $\frac{3}{4}$
121966	: 14 :	05
10083	: 02 :	07 $\frac{1}{4}$
13669	: 12 :	08 $\frac{1}{2}$
27333	: 13 :	04
17631	: 19 :	08 $\frac{1}{2}$
23732	: 18 :	06 $\frac{1}{2}$
3217	: 12 :	08
13699	: 12 :	04 $\frac{1}{4}$
1832999	: 17 :	02
499	: 06 :	05
1783	: 13 :	07
18925	: 19 :	10 $\frac{1}{4}$
174320	: 09 :	05
832192	: 13 :	07 $\frac{1}{2}$
282	: 09 :	09 $\frac{1}{4}$
1826	: 06 :	07
32103	: 08 :	11 $\frac{3}{4}$
32005	: 09 :	09 $\frac{1}{2}$
1033209	: 16 :	03 $\frac{1}{2}$

—II.—

By Avoirdupois Weight are commonly weighed Butter, Tallow, Iron, Lead, Wool, Tobacco, and all Sorts of Grocery Wares whence there may issue a Waste.

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
942	: 2	: 11
386	: 3	: 25
579	: 2	: 27
421	: 3	: 19
784	: 1	: 26
334	: 2	: 09
492	: 1	: 07
944	: 3	: 19
193	: 2	: 24
619	: 0	: 14

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
184	: 3	: 22
745	: 2	: 27
943	: 3	: 25
428	: 0	: 24
109	: 2	: 23
412	: 1	: 25
145	: 3	: 20
864	: 0	: 14
419	: 1	: 18
289	: 1	: 19

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
491	: 2	: 19
642	: 0	: 04
121	: 1	: 10
945	: 0	: 16
196	: 2	: 25
694	: 0	: 10
409	: 2	: 11
189	: 0	: 14
914	: 2	: 18

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
649	: 1	: 14
464	: 0	: 09
168	: 2	: 16
914	: 2	: 04
149	: 0	: 19
946	: 2	: 17
514	: 0	: 10
495	: 2	: 14
189	: 1	: 18

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
791	: 3	: 27
801	: 1	: 14
647	: 3	: 10
109	: 0	: 19
456	: 1	: 23
990	: 3	: 19
785	: 1	: 27

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
805	: 3	: 21
921	: 1	: 18
810	: 0	: 10
167	: 3	: 24
780	: 2	: 11
456	: 0	: 19
822	: 2	: 24

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
567	: 0	: 22
345	: 0	: 17
234	: 2	: 21
621	: 0	: 25
739	: 3	: 10
908	: 1	: 16
457	: 0	: 24

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
820	: 0	: 18
802	: 2	: 22
987	: 0	: 24
893	: 2	: 10
839	: 3	: 21
456	: 1	: 25
319	: 0	: 16

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
1890	: 0	: 18
908	: 2	: 24
1357	: 1	: 26
890	: 3	: 00
1067	: 0	: 23
986	: 2	: 10
1509	: 3	: 10

<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
1907	: 2	: 21
985	: 0	: 24
1567	: 2	: 25
457	: 0	: 05
1096	: 1	: 00
805	: 2	: 23
1890	: 0	: 06

<i>Tuns.</i>	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
184	: 09	: 1	: 19
495	: 19	: 2	: 24
514	: 14	: 1	: 10
946	: 12	: 2	: 17
149	: 19	: 0	: 19
198	: 14	: 2	: 16
945	: 18	: 0	: 16

<i>Tuns.</i>	<i>Ct.</i>	<i>qrs.</i>	<i>lb.</i>
914	: 18	: 2	: 18
198	: 16	: 0	: 14
409	: 19	: 2	: 18
694	: 13	: 0	: 19
914	: 14	: 1	: 24
196	: 09	: 2	: 25
121	: 19	: 1	: 10

—III.—

Of Troy Weight.

By Troy Weight are weighed Gold, Silver, Pearls, precious Stones, and Liquors.

<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	<i>gr.</i>	<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	<i>gr.</i>
898	: 10	: 15	: 15	439	: 09	: 18	: 20
834	: 09	: 13	: 04	946	: 11	: 09	: 19
284	: 11	: 07	: 22	409	: 08	: 18	: 04
439	: 10	: 10	: 12	981	: 11	: 16	: 13
646	: 11	: 08	: 21	981	: 11	: 14	: 14

<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	<i>gr.</i>	<i>lb.</i>	<i>oz.</i>	<i>pwt.</i>	<i>gr.</i>
109	: 02	: 02	: 23	428	: 09	: 06	: 22
943	: 11	: 03	: 20	745	: 11	: 11	: 12
184	: 10	: 13	: 20	412	: 10	: 19	: 22
784	: 08	: 01	: 21	421	: 03	: 15	: 23
579	: 02	: 11	: 23	386	: 01	: 12	: 22
943	: 02	: 11	: 18	234	: 02	: 09	: 20

Of Wine Measure.

<i>Tuns.</i>	<i>Hhd.</i>	<i>Gal.</i>	<i>Tuns.</i>	<i>Hhd.</i>	<i>Gal.</i>
31	: 1	: 09	79	: 1	: 06
42	: 3	: 06	28	: 3	: 09
84	: 2	: 46	37	: 1	: 43
90	: 0	: 08	72	: 0	: 11
62	: 2	: 38	34	: 3	: 38

—V.—

Of Cloth Measure.

<i>Yds.</i>	<i>Qrs.</i>	<i>Na.</i>	<i>Yds.</i>	<i>Qrs.</i>	<i>Na.</i>
43	:	1	:	2	
96	:	0	:	1	
74	:	1	:	0	
96	:	1	:	1	
87	:	3	:	2	

<i>Yds.</i>	<i>Qrs.</i>	<i>Na.</i>	<i>Yds.</i>	<i>Qrs.</i>	<i>Na.</i>
96	:	1	:	0	
89	:	3	:	2	
75	:	1	:	3	
87	:	0	:	1	
98	:	1	:	2	

—VI.—

Of Time.

<i>Ys.</i>	<i>Ds.</i>	<i>Ms.</i>	<i>Ms.</i>	<i>Ys.</i>	<i>Ds.</i>	<i>Ms.</i>	<i>Ms.</i>
31	:	149	:	19	:	53	
90	:	234	:	23	:	44	
53	:	318	:	16	:	31	
19	:	245	:	07	:	03	
51	:	141	:	06	:	34	

CHAP. VII.
REDUCTION OF COIN.
SECT. I.

To Reduce foreign and English Coin into Pounds Sterling.

The Rule.

MULTIPLY the given Number of Pieces by the Shillings, Pence or Half-pence, &c. that are in one Piece. Then bring the Product into Pounds Sterling by the foregoing Examples in Division.

Example.

1. How many l. Sterling are in 1567 Crowns, each 5s. 5d.? *Answ.* 424l. 7s. 11d.

1567 at 5s. 5d.	
65 12 2(1	
— — 359 (1	
7835 65 201888	{
9402 22222	
— 222	
101855	
	848 7 — 424l. 7s. 11d.

2. In 3695 Pistoles at 18s. 6d. each, how many l. Sterling? *Answ.* 3417l. 17s. 6d.

3. How many l. are in 1260 Ducatoons of 6s. each? *Answ.* 378l.

4. How many l. are in 3250 Guineas of 23s. each? *Answ.* 3737l. 10s.

5. In

5. In 9056 Cobs of 4s. 9d. each, how many l. ?
*Ans*w. 2150l. 16s.

6. How many l. are in 5789 Crowns of 5s. 5d. each? *Ans*w. 1567 l. 17s. 1d.

7. In 6954 Pieces of 5s. 10½d. how many l. ?
*Ans*w. 2042l. 14s. 9d.

8. How many l. are in 46080 Pieces of 13d.
*Ans*w. 2496l.

9. In 1090 Moidores of 30s. each, how many l. ? *Ans*w. 1635l.

10. How many l. are in 1000 Pieces of 6½d. each? *Ans*w. 27l. 1s. 8d.

11. In 10960 Groats how many l. Sterling?
*Ans*w. 182l. 13s. 4d.

12. How many l. are in 1094 Crowns of 58¾d. each? *Ans*w. 267l. 16s. 0½d.

13. In 954 Moidores of 29s. 10d. how many l. ?
*Ans*w. 1423l. 1s.

14. How many l. are in 478 Pistoles of 18s. 4d. each? *Ans*w. 438l. 3s. 4d.

—II.—

To Reduce Pounds Sterling, into Foreign and English Coin.

RULE.

Reduce the given Pounds Sterling, and the given Coin into one Name, then divide one by the other, and the Quotient is the Answer required.

Example.

Example.

15. A Merchant is to pay 3737l. 10s. With how many Guineas of 23s each can he do it?—
Answ. 3250 Guineas.

$$\begin{array}{r}
 3737\text{l. } 10\text{s. } 2 \\
 \quad 20 \quad 8\text{x} \\
 \hline
 74750 \quad 28338 \quad \left. \vphantom{\begin{array}{r} 3737\text{l. } 10\text{s. } 2 \\ 20 \quad 8\text{x} \\ \hline 74750 \quad 28338 \end{array}} \right\} 3250 \text{ Guineas.} \\
 \quad 222
 \end{array}$$

16. With how many Ducatoons of 6s. each could I pay 378l.? *Answ.* 1260.

17. In 3417l. 17s. 6d. how many Pistoles of 18s. 6d. each? *Answ.* 3695.

18. I demand how many Crowns of 5s. 5d. per Piece are equal to 1567l. 17s. 1d.? *Answ.* 5789.

19. With how many Crusadoes of 3s. 2d. per Piece could I pay 1093l. 2s. 8d.? *Answ.* 6904.

20. A Merchant is to pay 2042l. 14s. 9d. I demand with how many Ducatoons of 5s. 10½d. can he pay it? *Answ.* 6954.

21. How many Pieces of 13d. are equal to 2496l. *Answ.* 46080.

22. In 27l. 1s. 8d. how many Pieces of 6½d.? *Answ.* 1000.

23. With how many Moidores of 30s. per Piece can one pay 1635l.? *Answ.* 1090.

24. How many Pistoles of 18s. 6d. will be wanted to pay 162l. 17s. 6d.? *Answ.* 176 Pistoles, and 1s. 6d.

E

25. In

25. In 1000l. how many Moidores of 29s. 10d. per Piece? *Answ.* 670 Moidores, and 11s 8d.

—III.—

To reduce one Kind of Coin into another Kind of Coin.

R U L E.

Bring both Coins into the same denomination, and the Products divide by one another.

26. How many Crowns of 5s. 5d. per piece are equal to 19045 Cobs of 4s. 9d. per Piece?—
Answ. 16701.

19045 of	4s. 9d.	5s. 5d.	
57	12	12	
133315	57	65	
95225			
1085565			
			#
			488
			2088868 } 16701
			688888
			6666

27. How many Pistoles of 18s. 6d. per Piece are contained in 1001 Crowns of 5s. 5d. per Piece? *Answ.* 293 Pistoles and 1s. 7d.

28. In 16701 Crowns of 5s. 5d. each, how many Cobs of 4s 9d. each? *Answ.* 19045.

29. How many Crowns of 5s. 5d. each are in 976 Pistoles of 18s. 6d. each? *Answ.* 3333 Crowns, and 2s. 3d.

30. How

30. How many Guineas of 23s. per piece are worth 1984 Moldores of 30s. each? *Answ.* 2587 Guineas, and 19s.

31. In 10000 Pieces of 13d. how many Crowns of 5s. 5d.? *Answ.* 2000.

32. How many Crowns of 5s. 5d. are equal to 20000 Pieces of 6½d. *Answ.* 2000.

33. How many Cobs of 4s. 7½d. per piece are worth 564 Ducatoons of 5s. 10½d. per Piece?—*Answ.* 716 Cobs, and 2s.

34. A Merchant has a certain Quantity of Crowns of 5s. 5d. each, which he changes with a Cashier for Guineas of 23s. per Piece, and receives of him 1000 Guineas. I demand how many Crowns the Merchant had? *Answ.* 4246 Crowns and 10d.

—IV.—

35. A Merchant receives the following different Species. I demand how many Pounds Sterling they make? *viz.*

				<i>l.</i>	<i>s.</i>	<i>d.</i>
467 at 5s. 5d.	-	-	-	"		
942 at 4s. 9d.	-	-	-	"		
120 at 18s 6d.	-	-	-	"		

Answ. £. 461 : 4 : 1

36. Received of A—B—, £. 582 : 14 : 8 on Account, or in Part Payment, of 500 Casks of Butter sold him, *viz.*

			<i>l.</i>	<i>s.</i>	<i>d.</i>
709 at 5s. 5d.	-	-	-	-	"
296 at 4s. 9d.	-	-	-	-	"
201 at 23s.	-	-	-	-	"
96½ at 18s. 6d.	-	-	-	-	"

Ans. £. 582 : 14 : 8

37. Paid M—D—, £. 534 : 19 : 10 in Part Payment of 30 Tuns of Tallow bought of him, viz.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
150 at 18s. 6d.	-	-	-	-	"
85½ at 23s.	-	-	-	-	"
1100 at 5s. 5d.	-	-	-	-	"

Ans. £. 534 : 19 : 10

38. Received of C—H—, £. 411 : 17 : 11½ in full for Balance of all accounts to this Day, viz.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
50 at 5s 10½d.	-	-	-	-	"
103 at 3s. 10½d.	-	-	-	-	"
205 at 3s. 2d.	-	-	-	-	"
219 at 3s. 4d.	-	-	-	-	"
1000 at 5s. 5d.	-	-	-	-	"
140½ at 18s 6d.	-	-	-	-	"

Ans. £. 411 : 17 : 11½

39. Paid S—T— 200l. 19s. 2d. in part Payment of 300 tanned Hides bought of him, viz.

			<i>l.</i>	<i>s.</i>	<i>d.</i>
100 at 5s. 5d.	-	-	-	-	-
50 at 23s.	-	-	-	-	-
80 at 18s. 6d.	-	-	-	-	-
70 at 6s.	-	-	-	-	-
90 at 4s. 9d.	-	-	-	-	-

£. 200 : 19 : 2

40. Received of J—I— 270*l.* for my Bill on J—E—of London, for 250*l.* at 8 per Ct. *viz.*

			<i>l.</i>	<i>s.</i>	<i>d.</i>
100 at 23s.	-	-	-	-	-
95½ at 18s. 6d.	-	-	-	-	-
75½ at 5s. 5d.	-	-	-	-	-
94 at 5s. 10½d.	-	-	-	-	-
300 at 1s. 1d.	-	-	-	-	-
2 at 23s.	-	-	-	-	-
In Copper, 1s. 0½d.	-	-	-	-	-

£. 270 : 0 : 0

41. Paid G—F— 261*l.* 5s. 4½d. in part of 1500 Stone of Wool bought of him, *viz.*

			<i>l.</i>	<i>s.</i>	<i>d.</i>
300 at 5s. 5d.	-	-	-	-	-
100 at 6s.	-	-	-	-	-
150½ at 18s. 6d.	-	-	-	-	-
199½ at 1s. 1d.	-	-	-	-	-

£. 261 : 5 : 4½

42. Paid P—P— on Account of 100 Kilderkins of Wheat bought of him, *viz.*

E 3

931½

		<i>l.</i>	<i>s.</i>	<i>d.</i>
931 $\frac{1}{2}$ at 5s. 5d.	-	"		
314 $\frac{1}{2}$ at 4s. 9d.	-	"		
72 $\frac{1}{2}$ at 30s.	-	"		
94 at 29s. 10d.	-	"		
27 $\frac{1}{2}$ at 18s. 6d.	-	"		
30 at 18s. 2d.	-	"		
27 at 6 $\frac{1}{2}$ d.	-	"		

£. 629 : 7 : 2 $\frac{1}{2}$

43. Received of R---F--- by Order, and for Account of S---S---, viz.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
1036 $\frac{1}{2}$ at 13d.	-	"		
931 at 3s. 4d.	-	"		
97 at 29s. 8d.	-	"		
104 at 29s. 6d.	-	"		
58 at 18s. 4d.	-	"		
275 $\frac{1}{2}$ at 18s. 6d.	-	"		
431 $\frac{1}{2}$ at 23s.	-	"		
57 $\frac{1}{2}$ at 30s.	-	"		

£. 1399 : 1 : 5 $\frac{1}{2}$

44. Paid B--- B--- in full of all Accounts, viz.

		<i>l.</i>	<i>s.</i>	<i>d.</i>
100 at 29s. 10d.	-	"		
256 at 29s. 8d.	-	"		
75 at 18s. 4d.	-	"		
159 at 18s. 2d.	-	"		
2036 $\frac{1}{2}$ at 5s. 5d.	-	"		
457 $\frac{1}{2}$ at 6s.	-	"		
694 $\frac{1}{2}$ at 4s. 9d.	-	"		
96 at 4s. 7 $\frac{1}{2}$ d.	-	"		
103 at 5s. 10 $\frac{1}{2}$ d.	-	"		

£. 1648 : 5 : 6 $\frac{1}{2}$

45. Paid

45. Paid W—H— for my Cash Note, (No. 129) taken up, viz.

					<i>l.</i>	<i>s.</i>	<i>d.</i>
23	at	8os.	-	-	"		
13	at	79s. 8d.	-	-	"		
36	at	79s. 10d.	-	-	"		
24	at	79s. 6d.	-	-	"		
29	at	40s.	-	-	"		
16	at	39s. 10d.	-	-	"		
19	at	39s. 8d.	-	-	"		
11	at	39s. 6d.	-	-	"		
39	at	20s.	-	-	"		
27	at	19s. 10d.	-	-	"		
25	at	19s. 8d.	-	-	"		
20	at	30s.	-	-	"		
10	at	29s. 10d.	-	-	"		
14	at	29s. 8d.	-	-	"		
7	at	29s. 6d.	-	-	"		
5	at	23s.	-	-	"		
17	at	15s.	-	-	"		
4	at	14s. 8d.	-	-	"		
7	at	10s.	-	-	"		
3	at	9s. 10d.	-	-	"		
2	at	9s. 8d.	-	-	"		
5	at	9s. 3d.	-	-	"		
3	at	11s. 6d.	-	-	"		
19	at	5s.	-	-	"		
26½	at	5s. 5d.	-	-	"		
32	at	5s. 6d.	-	-	"		

£.750:13:3½

46. Received

46. Received of J—D— 327l. for my Bill for 300l. English, which I have drawn on C—B— for his account at 9 per Ct. viz.

			l.	s.	d.
13 at 77s. 8d.	-	"			
25 at 77s. 6d.	-	"			
14 at 38s. 10d.	-	"			
29 at 19s. 6d.	-	"			
27 at 19s. 4d.	-	"			
20 at 22s. 9d.	-	"			
7 at 29s. 3d.	-	"			
9 at 29s. 1d.	-	"			
16 at 28s. 11d.	-	"			
26 at 18s. 3d.	-	"			
1 at 22s. 9d.	-	"			
3 at 9s. 10d.	-	"			
2 at 9s. 8d.	-	"			
1 at 9s. 2d.	-	"			
1 at 9s.	-	"			
2 at 4s. 11d.	-	"			
1 at 4s. 9d.	-	"			

Returned

£. 327 : 1 : 4
1 : 4

£. 327 : 0 : 0

C H A P. VIII.

THE RULE OF THREE DIRECT.

S E C T. I.

THE Rule of Three teaches by three Numbers given to find out a fourth, which shall bear such Proportion to the Second, as the Third doth to the First.

R U L E.

In stating the Question, your first and third Numbers must be of one Name, and if they are not so, reduce them to it. If the middle Number (which always differs in Name from the third) has more than one Denomination, reduce it to the lowest mentioned. Then multiply the second and third Numbers together, and the Produce divide by the first Number, the Quotient of that Division will be the Answer, in the same Name as the middle Number was reduced to.

Note, 1. The first Number is always known by the Word if, or at, and the third Number is known by the Words how much, or what will.

Note, 2: When the first Number is an Unit, the Answer is found by Multiplication only. When the second or third Number is an Unit, the Answer will be found by Division only.

1. If one Yard of Cloth cost 4s. what will 25 Yards cost? *Ans.* 5l.

Example

46. Received of J—D— 327l. for my Bill for 300l. English, which I have drawn on C—B— for his account at 9 per Ct. viz.

			l.	s.	d.
13 at 77s.	8d.	-	"		
25 at 77s.	6d.	-	"		
14 at 38s.	10d.	-	"		
29 at 19s.	6d.	-	"		
27 at 19s.	4d.	-	"		
20 at 22s.	9d.	-	"		
7 at 29s.	3d.	-	"		
9 at 29s.	1d.	-	"		
16 at 28s.	11d.	-	"		
26 at 18s.	3d.	-	"		
1 at 22s.	9d.	-	"		
3 at 9s.	10d.	-	"		
2 at 9s.	8d.	-	"		
1 at 9s.	2d.	-	"		
1 at 9s.		-	"		
2 at 4s.	11d.	-	"		
1 at 4s.	9d.	-	"		

Returned

£. 327 : 1 : 4
1 : 4

£. 327 : 0 : 0

C H A P. VIII.

THE RULE OF THREE DIRECT.

S E C T. I.

THE Rule of Three teaches by three Numbers given to find out a fourth, which shall bear such Proportion to the Second, as the Third doth to the First.

R U L E.

In stating the Question, your first and third Numbers must be of one Name, and if they are not so, reduce them to it. If the middle Number (which always differs in Name from the third) has more than one Denomination, reduce it to the lowest mentioned. Then multiply the second and third Numbers together, and the Produce divide by the first Number, the Quotient of that Division will be the Answer, in the same Name as the middle Number was reduced to.

Note, 1. The first Number is always known by the Word if, or at, and the third Number is known by the Words how much, or what will.

Note, 2: When the first Number is an Unit, the Answer is found by Multiplication only. When the second or third Number is an Unit, the Answer will be found by Division only.

1. If one Yard of Cloth cost 4s. what will 25 Yards cost? *Ans.* 5l.

Example

Example.

Yd.	s.	Yd.
1	4	25
	4	
	10	
	0	

Answ. 5*l.*

2. If 1lb. of Sugar cost 8d. what will 112lb. come to? *Answ.* 3*l.* 14s. 8d.

3. What will 17 Tuns of Tallow come to, at 25*l.* the Tun? *Answ.* 425*l.*

4. If one Piece of Silk cost 27*l.* how much will 50 Pieces cost? *Answ.* 1350*l.*

5. If one earns ten Shillings a Week, what will it come to in 52 Weeks? *Answ.* 26*l.*

6. What will 215 Ct. of Madder cost at the Rate of 50s. per Ct.? *Answ.* 537*l.* 10s.

7. At 6s. the Barrel of Barley, what will 139 Barrels come to? *Answ.* 41*l.* 14s.

8. What will 1050lb. of Merchandize come to at 19d. the lb.? *Answ.* 83*l.* 2s. 6d.

9. If one Pound of Raisins cost 9 Farthings, what will 112lb. cost? *Answ.* 1*l.* 1s.

10. If one spends 6 Pence a Day, what doth it amount to in one Year of 365 Days? *Answ.* 9*l.* 2s. 6d.

11. How much will 112lb. of Indigo come to at the Rate of 5s. the lb.? *Answ.* 28*l.*

At

12. At 7s. the Gallon of Brandy, what will a Hhd. come to? *Answ.* 22l. 1s.

—II.—

13. If 1lb. of Indigo cost 5s. 6d. what will one Hundred Weight cost? *Answ.* 30l. 16s.

Example.

lb.	s.	d.	lb.
1	5	6	112
	12		66
	66		672
			672
			7392

$$\begin{array}{r}
 17 \\
 7392 \\
 1222 \\
 12
 \end{array}
 \left. \vphantom{\begin{array}{r} 17 \\ 7392 \\ 1222 \\ 12 \end{array}} \right\}
 \begin{array}{r}
 61 \\
 6 \\
 \hline
 30 \text{ l. } 16 \text{ s.}
 \end{array}$$

14. How much will 7 Tuns of Butter come to at 18l. 10s. per Tun? *Answ.* 129l. 10s.

15. At 18s. 6d. the Ct. what will 120 Ct. come to? *Answ.* 111l.

16. If one Barrel of Barley cost 6s. 7d. what will 100 Barrels come to? *Answ.* 32l. 18s. 4d.

17. What will 112lb. of Sugar come to at 7½d. per lb.? *Answ.* 3l. 10s.

18. If one Hundred of Merchandizes cost 18s. 8d. how much will 314 Ct. come to? *Answ.* 293l. 1s. 4d.

19. At

19. At $3\frac{1}{4}$ d. the lb. what will 112lb. come to?
Answ. 1l. 10s. 4d.

—III.—

20. If one Ounce of Spice cost 2 Shillings,
 what will 112lb. cost? *Answ.* 179l. 4s.

Example.

oz.	s.	lb.
1	2	112
		16
		1792 oz.
		2
		358 4
		£. 179 : 4

21. At 12 Shillings the Yard, how much will
 10 Pieces of Cloth come to, every Piece 42 Yds.? *Answ.* 252l.

22. What will 31 Tuns of Wine come to, at
 9l. per Hhd.? *Answ.* 1116l.

23. If a Gallon of Oil cost 8s. how much will
 10 Pipes come to, each Pipe 120 Gallons? *Answ.* 480l.

24. How much will 59 Barrels of Oats come to
 at 3 Pence the Peck? *Answ.* 11l. 16s.

25. If one Gallon of Brandy cost 5s. how
 much will 8 Hhds. come to? *Answ.* 126l.

26. At

26. At 9 Pence the lb. what will 9 Casks of Merchandizes come to, each weighing 40lb.?
Answ. 13l. 10s.

27. What will 3 Casks of Merchandizes come to, each weighing 2 Hundred Weight, and at 7d. the lb. ? *Answ.* 19l. 12s.

—IV.—

28. If one Yard off Stuff cost 17 Pence, what will 3 Pieces and 10 Yards come to, each Piece 42 Yards ? *Answ.* 9l. 12s. 8d.

Example.

Yd.	d.	Ps.	Yds.
1	17	3	: 10
		42	
		136	
		17	
		952	
		136	
		2312	

224	{	19 1/2
222		
22		9l. 12s. 8d.

29. What would 224lb. 6 oz. of Spice come to, at the Rate of 3s. the oz. ? *Answ.* 538l. 10s.

F

30. If

30. If one Peck of Oats cost 4d. what will 20 Barrels and 6 Pecks cost? *Answ.* 5l. 8s. 8d.

31. How much will 12lb. 10 oz. of Silver come to, at 5s. per oz.? *Answ.* 38l. 10s.

32. What will 156Ct. 2qrs. of Merchandizes comes to, at the Rate of 7d. per lb.? *Answ.* 511l. 4s. 8d.

33. If one Gallon of Brandy cost 4s. what will 12 Hhds. and 36 Gallons come to? *Answ.* 158l. 8s.

34. What must I pay for 15 Tuns and 6 Ct. of Butter, at the Rate of 23s. per Ct.? *Answ.* 351l. 18s.

—V.—

35. If one Ounce of Spice cost 3s. 4d. what will 18lb. 10 oz. cost? *Answ.* 49l. 13s. 4d.

Example.

oz.	s.	d.	lb.	oz.
1	3	4	18	10.
	12		16	
		40	108	
			19	
xx4(4	{	99 3		
xx920				
xx222			298	
xx		49l. 13s. 4d.	40	
			11920	

36. If 1lb. of Tea cost 11s. 9d. what will 4 Ct. 3qrs. come to? *Answ.* 312l. 11s.

37. I demand the amount of 50 Pieces and 10 Yards of Cloth, at the Rate of 4s. 9d. per Yard, each Piece containing 20 Yards? *Answ.* 239l. 17s. 6d.

38. What will 76Ct. 0qrs. 8lb. of Coffee come to, at 2s. 6d. the lb? *Answ.* 1065l.

39. If one Pound of any Thing cost 1s. 9d. how much will 7Ct. 2qrs. 26lb. come to? *Answ.* 75l. 15s. 6d.

40. At 10l. 10s. the Hhd. of Wine, what will 25 Tuns and 3 Hhds cost? *Answ.* 1081l. 10s.

41. What will 150 tann'd Hides come to, weighing 39Ct. 3qrs. 1lb. at 6 $\frac{1}{4}$ d. per lb.? *Answ.* 115l. 19s. 3 $\frac{1}{4}$ d.

—VI.—

42. If one Tun of Wine cost 42l. what will 25 Tuns 2 Hhds. cost? *Answ.* 1071l.

Example.

Tun,	l.	Tuns. Hhds.
1	42	25 : 2
4		4

102 Hhds.

42

204

408

42\$4 { 1071l.

F 2

43. At

43. At 14s. 4d. the Ct. of Cheefe, what will
11 Ct. 2qrs come to? *Answ.* 8l. 19s. 2d.

44. How much will 17 Ct. 2qrs. of Butter come
to, at 19s. 10d. per Ct.? *Answ.* 17l. 7s. 1d.

45. If one Shilling gains 3d. what will 56s. 8d.
gain? *Answ.* 14s. 2d.

46. What the Amount of 760 Stone and 8lb.
of Wool, at the Rate of 11s. 6d. per Stone?
Answ. 437l. 5s. 9d.

47. What must I pay for 48 Tuns, 3 Hhds of
Wine, if 1 Tun cost 44l.? *Answ.* 2145l.

—VII.—

48. If in 5 Days I spend 1l. what will that
amount to in a Year of 365 Days? *Answ.* 73l.

Example.

$$\begin{array}{rcccl} \text{Ds.} & & \text{l.} & & \\ 5 & \text{---} & 1 & \text{---} & x \\ & & & & 365 \end{array} \left. \vphantom{\begin{array}{rcccl} \text{Ds.} & & \text{l.} & & \\ 5 & \text{---} & 1 & \text{---} & x \\ & & & & 365 \end{array}} \right\} 73\text{l.}$$

49. If one Tun of Tallow cost 27l. how many
Tuns can I have for 1350.? *Answ.* 50 Tuns.

50. How many Oranges can I have for 100
Crowns, at 2. Crowns per Hundred, each Hundred
6 Score? *Answ.* 6000.

51. If 5 Apples cost 1 Penny, what would
1000 Apples cost? *Answ.* 16s. 8d.

52. How many Herrings can I have for 1 Penny,
if 1000 Herrings cost 16s. 8d.? *Answ.* 5 Herrings.

—VIII—

—VIII.—

53. If one Hundred of Butter cost 25 Shillings?
how many Hundred can I have for 162l. 10s.
Answ. 130Ct.

Example.

$$\begin{array}{ccccccc} s. & & Ct. & & l. & & s. \\ 25 & \text{---} & 1 & \text{---} & 162 & : & 10 \\ & & & & 20 & & \end{array}$$

$$\begin{array}{r} 7 \\ 8230 \\ 2833 \\ 22 \end{array} \left. \vphantom{\begin{array}{r} 7 \\ 8230 \\ 2833 \\ 22 \end{array}} \right\} 130Ct.$$

34. At 15s. per Ct. how many Ct. can I have
for 615l. 15s.? *Answ.* 821Ct.

55. If one Peck of Barley cost 9d. how many
Barrels can I buy for 153l. 18s.? *Answ.* 256.
Barrels and 8 Pecks.

56. How many lb. of Spice can I have for 216l.
18s. if 1 oz. costs 3s.? *Answ.* 90lb. 6 oz.

57. What quantity of Tallow can be bought
for 121l. 10s. at the Rate of 18s. per Ct.? *Answ.*
135Ct.

58. If 1 lb. of Pepper cost 17½d. how many
Ct. can I have for 77l. 8s. 9d.? *Answ.* 9 Ct. 1qr.
26lb.

—IX.—

59. If 1 Tun of Butter cost 24l. how many
Tuns can I buy for 180l. *Answ.* 7 Tuns 10 Ct.

F 3

Example.

$$\begin{array}{rcl}
 \text{I.} & \text{Tun.} & 12 \text{ Tuns} \\
 24 \text{ ——— } 1 \text{ ——— } 12 & \left. \begin{array}{l} \text{ } \\ \text{ } \\ \text{ } \end{array} \right\} & \begin{array}{l} 7 \text{ and } 12 \text{ over.} \\ 20 \end{array} \\
 & & \\
 \begin{array}{l} 240 \\ 244 \\ 2 \end{array} \left. \begin{array}{l} \text{ } \\ \text{ } \\ \text{ } \end{array} \right\} & 10 \text{ Ct.} & \begin{array}{r} \text{—} \\ 240 \end{array}
 \end{array}$$

60. How much will 159 Yards of Ratteen come to, if for 16 Yards I pay 20s. *Answ.* 9l. 18s. 9d.

61. If one Tun of Wine cost 28l. what Quantity can I have for 301l. ? *Answ.* 10 Tuns 3 Hhds.

62. What will 5 Pieces of Stuff come to, if for 16 Yards I pay 1l. each Piece containing 41 Yards ? *Answ.* 12l. 16s. 3d.

63. How much Butter can be bought for 121l. 12s. at the Rate of 28s. per Ct. ? *Answ.* 86 Ct. 3qrs. 12lb.

64. If one Tun of Brandy cost 40l. 12s. what Quantity can be bought for 720l. 13s. ? *Answ.* 17 Tuns 3 Hhds.

65. If one lb. of any thing cost 3s. 4d. how many lb. can I have for 160l. 15s. 10d. ? *Answ.* 964lb. 12 oz. or 8 Ct. 2 qrs. 12 lb. 12 oz.

—X.—

66. If 7lb. of Madder cost 42d. what will 1lb. cost ? *Answ.* 6d.

Example.

$$\begin{array}{rcl}
 \text{lb.} & \text{d.} & \text{lb} \\
 7 \text{ ——— } 42 & \text{—} & 1 \text{ come } 6\text{d}
 \end{array}$$

67. If

67. If 25 Tuns of Butter cost 450l. what will one Tun be worth? *Ans.* 18l.

68. What will 1 Hhd. of Wine be worth, if 105 Hhds. cost 1155l.? *Ans.* 11l.

69. If in 52 Weeks I earn 156l. how much is that in one Week? *Ans.* 3l.

70. Suppose 150 Men were provided with 900lb. of Bread for two Months, I demand each Man's Share? *Ans.* 60.

—XI.—

71. If 1 Ct. of Butter cost 18s. 8d. what is 1lb. worth? *Ans.* 2d.

Example.

$$\begin{array}{rcccc}
 \text{lb.} & & \text{s.} & \text{d.} & \text{lb.} \\
 112 & \text{---} & 18 & : 8 & \text{---} & 1. \\
 & & 12 & & & \\
 \hline
 & & 224 & \left\{ \begin{array}{l} 2\text{d.} \\ 112 \end{array} \right. & &
 \end{array}$$

72. If 101 salt Ox Hides weigh 75 Ct. 3qrs. what do they weigh a Piece one with another? *Ans.* 84lb.

73. What will 1 Hhd. of Wine cost, if 15 Hhds. cost 162l. 10s.? *Ans.* 10l. 16s. 8d.

74. At 23s. 4d. per Ct. what is it a lb.? *Ans.* 2½d.

75. What will 1lb. cost at the Rate of 46s. 8d. per Ct.? *Ans.* 5d.

76. Suppose

76. Suppose 305 tann'd Hides weigh 76 Ct. 1qr. what do they weigh a Piece one with another? *Answ.* 28l.

77. If one Ct. cost 32s. 8d. what is it a lb.? *Answ.* 3 $\frac{1}{2}$ d.

—XII—

78. If 45 Ct. of Merchandizes cost 60l. 11s. 3d. what is one Ct. worth? *Answ.* 1l. 6s. 11d.

Example.

Ct.	l.	s.	d.	Ct.
45	60	11	3	1
	20			
	1211			
	12			
	24533			$\left. \begin{array}{l} \$11 \\ 323 \\ 122 \\ 2 \end{array} \right\} \begin{array}{l} 2 6 \\ \hline 11. 6s. 11d. \end{array}$
	4533			
	44			

79. What will one Tun of Merchandizes stand me in, if for 13 Tuns I pay 24l. 1s. 11d.? *Answ.* 8l. 10s. 11d.

80. If 284lb. of any Thing cost 22l. 3s. 9d. what costs 1lb.? *Answ.* 1s. 6 $\frac{3}{4}$ d.

81. What will 1 Ct. of Butter be worth, if 500 Ct. cost 525l. 10s. 5d.? *Answ.* 1l. 1s. 0 $\frac{1}{4}$ d.

82. If 369lb. of Indigo cost 99l. 11s. 0 $\frac{3}{4}$ d. what is 1lb. worth? *Answ.* 5s. 4 $\frac{3}{4}$ d.

83. What will one Yard of Canvas cost, if for 5690 Yards I pay 88l. 18s. 1 $\frac{1}{2}$ d.? *Answ.* 3 $\frac{3}{4}$ d.

84. If

84. If 301 Barrels of Beef cost 302l. 5s. 1d. what costs 1 Barrel? *Ans.* 1l. 0s. 1d.

—XIII.—

85. If 10 Pieces of Cloth (every Piece 42 Yards) cost 126l. what will 1 Yard cost? *Ans.* 6s.

Example.

Pr.	l.	Yd.
10	126	1
42	20	
420	2520	

Ans. 6s.

86. If 575 Hundred of Herrings, of 6 Score to the Hundred, cost 25 Guineas of 23s. each, how many is that for 1s.? *Ans.* 120.

87. If 10 Tuns of Brandy costs 680l. what will one Hhd. stand in? *Ans.* 17l.

88. What is one Ct. of Butter worth, if 5 Tuns cost. 130l.? *Ans.* 26s.

89. If 5 Hhds. of Brandy cost 84l. what is that a Gallon? *Ans.* 5s. 4d.

90. If 2 Pipes of Oil, qt. 240 Gallons, cost 36l. what is 1 Quart worth? *Ans.* 9d.

—XIV.—

91. If 6lb. 6oz. of Avoir-du-pois wt. cost 4l. 5s. what will 1 oz. cost? *Ans.* 10d.

Example.

Example.

lb.	oz.	l.	s.	oz.				
6	:	6	—	4	:	5	—	1
16				20				
202				85				
				12				
				2020				

Answ. 10d.

12. What will one Hhd. cost, if for 12 Tuns 3 Hhds. I pay 459l. ? Answ. 9l.

93. If 27 Ct. 2qrs. of Merchandizes cost 341l. what is one qr. worth ? Answ. 3l. 2s.

94. If 3 Pieces and 10 Yards of Cloth (each Piece 42 Yards) cost 115l. 12s. what cost 1 Yard Answ. 17s.

95. What is 1lb. of Butter worth, if for 429 Ct. 0qrs. 24lb. I pay 650l. 19s. 6d. ? Answ. 3¼d.

96. If 17 Tuns 2 Hhds of Wine cost 896l. 17s. 6d. what is that a Hhd. ? Answ. 12l. 16s. 3d.

—XV.—

97. A Merchant buys 2 Hhds. of Madder, wt. 17 Ct. 2qrs. for 52l. 10s. I demand what 1 Ct. costs ? Answ. 3l.

Example

The Rule of Three Direct.

71

Example.

Ct. qrs.	l.	s.	Ct.
17 : 2	52 : 10	—	1
4	20	—	4
—	—	—	—
70	1050	—	—
	4	—	—
	4200	—	—
	770	—	—
	Anfw. 3l.	—	—

98. If 7 Tuns 2 Hhds. of Brandy cost 360l. what is 1 Ton worth? *Anfw.* 48l.

99. What will 1lb. of Spice cost, if 7lb. 8oz. cost 4l. 5s.? *Anfw.* 11s. 4d.

100. If 112l. 15s. gain 22l. 11s. what will 1l. gain? *Anfw.* 4s.

101. What will 1 Ct. of Butter come to, if for 33Ct. 1qr. 22lb. I pay 46l. 16s. 6d.? *Anfw.* 28s.

102. If 67 Hhds. and 9 Gallons of Brandy cost me 634l. 10s. what doth 1 Hhd. cost? *Anfw.* 9l. 9s.

103. If 203 Tuns 9 Ct. 3qrs. 3lb. of Tallow stand me in 4558l. 3s. what doth one Tun cost? *Anfw.* 22l. 8s.

—XVI.—

104. If 14lb. of Sugar are Sold for 13s. at what Rate is that the Ct. *Anfw.* 5l. 4s.

Example

The Rule of Three Direct.

Example.

lb. s. lb.

14—13—112

13

336

112

$$\begin{array}{r} 2436 \\ 2444 \\ 22 \end{array} \left\{ \begin{array}{l} 10(4 \\ 51.4s. \end{array} \right.$$

Or thus,

lb. s. lb.

24—13—112

8

13

10|4

51.4s.

105. If 5 Yards of Cloth cost 35s. what will 3 Yards cost? *Answ.* 21s.

106. What Quantity of Raisins can I have for 63d. if 7lb. cost 21d.? *Answ.* 21lb.

107. If 7lb. of Sugar cost 5s. how many Ct. can I have for 127l.? *Answ.* 31 Ct. 3qrs.

108. What Quantity of Figs can I have for 21d. if 21lb. cost 63d.? *Answ.* 7lb.

—XVII.—

109. If in 365 Days I spend 18l. 5s. how much is that a Week? *Answ.* 7s.

Example.

ds. l. s. ds.

365—18 : 5—7

20

365

7

$$\begin{array}{r} 2888 \\ 368 \end{array} \left\{ \begin{array}{l} 7s. \text{ Answ.} \end{array} \right.$$

Or thus.

ds. l. s. ds.

365—18 : 5—7

20

368

Answ. 7s.

116. If 840lb. cost 10l. 10s. what will 35lb. cost? *Answ.* 8s. 9d.

111. What will 112lb. stand in, if 7lb. are worth 1s. 2d.? *Answ.* 18s. 8d.

112. If 112lb. of Currants cost. 1l. 12s. 8d. what will 7lb. come to? *Answ.* 2s. 0½d.

113. What will 25lb. of any thing come to, at the Rate of 9l. 6s. 8d. the 100lb.? *Answ.* 2l. 6s. 8d.

114. How much will 84lb. of Merchandizes cost, if 1 Ct. cost 1l. 7s.? *Answ.* 1l. 0s. 3d.

115. How much Beef can I buy for 100l. if 802 Ct. 1qr. 17lb. cost 650l.? *Answ.* 123Ct. 1qr. 22lb.

—XVIII.—

116. If 9 Tuns of Wine cost 72l. how many Tuns can I have for 100l.? *An. w.* 12 Tuns, 2 Hhds.

Example.

72 — 9 — 100

9

— } Tuns.
900 } 12 and 36 over.
722 }
7 }

4
— } Hhds.
244 } 2
72 }

G

Or

Or Thus,

$$\begin{array}{rcl}
 \text{l.} & \text{Tuns.} & \text{l.} \\
 72 & \text{---} 9 & 100 \\
 & 8 & \$\$ \\
 \end{array}
 \left\{ \begin{array}{l} \text{Tuns.} \\ 12 \text{ and } 4 \text{ over.} \end{array} \right.
 \begin{array}{r}
 \text{---} \\
 16 \\
 \$
 \end{array}
 \left\{ \begin{array}{l} 2 \text{ Hhds.} \end{array} \right.$$

Or Thus:

$$\begin{array}{rcl}
 \text{l.} & \text{Tuns.} & \text{l.} \\
 72 & \text{---} 9 & 100 \\
 2 & 4 & 22 \\
 \hline
 & 36 &
 \end{array}
 \left\{ \begin{array}{l} 12 \\ 80 \\ 44 \end{array} \right\} 12 \text{ Tuns } 2 \text{ Hhds.}$$

117. What will 6500lb. come to, if 5600lb. cost 735l.? *Answ.* 853l. 2s. 6d.

118. How many Tuns of Brandy can I buy for 2133l. if 12 Tuns cost 1296l.? *Answ.* 19 Tuns, 3 Hhds.

119. If 60 Ct. of Hops cost 320l. what Quantity can I have for 460l.? *Answ.* 862 Ct. 2qrs. 21lb.

—XIX.—

120. If 3 Hhds. of Brandy cost 68l. 17s. what will 7 Gallons be worth? *Answ.* 2l. 11s.

Example.

$$\begin{array}{rcl}
 \text{Hhds. l.} & \text{s. Gal.} & \\
 3 & \text{---} 68 & 17 \text{---} 7 \\
 63 & 20 & \\
 \hline
 189 & 1377 & \\
 & 7 & \\
 \hline
 & 18 &
 \end{array}$$

$$\begin{array}{r}
 18 \\
 9639 \\
 2899 \\
 18
 \end{array}
 \left\{ \begin{array}{l} 5 \mid 1 \\ 2 \text{ l. } 11 \text{ s.} \end{array} \right.$$

Or Thus,

$$\begin{array}{rcl}
 \text{Hhds. l.} & \text{s. Gal.} & \\
 3 & \text{---} 68 & 17 \text{---} 7 \\
 63 & 20 & \\
 9 & \text{---} & \\
 \hline
 189 & 1377 & \\
 27 & 277 & \\
 \hline
 & 2 & 2 \text{ l. } 11 \text{ s.}
 \end{array}$$

121. A Merchant bought 14 Casks of Indigo, Wt. 8Ct. for 313l. 12s. I demand what 7lb. are worth? *Answ.* 2l. 9s.

122. If 10Ct. of Merchandizes cost 384 Crowns of 5s. 5d. each, what wili 14lb. come to? *Answ.* 26s.

123. What will 4 Yards of Cloth cost, if 19 Pieces (each Piece 35 Yards) cost 280 Cobs, each Cob at 4s. 9d.? *Answ.* 8s.

124. If 2 Pipes of Oil cost 82l. 10s. each Pipe 120 Gallons, what will 1 Jar, containing 20 Gallons, cost? *Answ.* 6l. 17s. 6d.

125. What will a Quarter of an Hundred of Coffee come to, if 3 Bales containing 10 Ct. cost 143l. 16s. 8d.? *Answ.* 3l. 11s. 11d.

—XX.—

126. If for 1s. 6d. I can buy 7lb. of Raisins, what Quantity can I buy for 605l. 11s.? *Answ.* 504 Ct. 2qrs. 14lb.

Example.

s.	d.	lb.	l.	s.
1	6	7	605	11
			20	
			12111	
			12	
			1017324	

2	(1	2	Ct. qrs. lb.	145332
221934	23(4	2(2	504 : 2 : 14	7
2017324	36328	2018		
288888	28888	AAA		
2222	222			

12 If

134. What will 112 Ct. 3 qrs. 23lb. of Butter come to, if 95 Ct. 0 qrs. 20lb. cost 88l. 16s. 8d.?
Ans. 105l. 8s. 6d.

135. If 1 qr. 14lb. of Merchandizes cost 2l. 1s. 9d. what will 50 Ct. 3 qrs. 24 lb. come to?
Ans. 378l. 16s. 8 $\frac{2}{3}$ d.

136. If 100lb. of any thing cost 25l. 6s. 3d. what will 625lb. cost? *Ans*w. 158l. 4s. 0 $\frac{3}{4}$ d.

137. What will 25 Ct. 0 qrs. 20lb. cost, if 112 Ct. 3 qrs. 23lb. cost 105l. 8s. 6d.? *Ans.* 23l. 10s.

—XXII.—

138. If 1lb. of Spice cost 10s. 8d. what is half an Ounce worth? *Ans*w. 4d.

Example.

lb. s. d. oz.
 1 ——— 10 : 8 ——— $\frac{1}{2}$
 32 12

 } 4d.

139. What will 1 lb. of Spice cost, if half an Ounce cost 4d. ? *Ans.* 10s. 8d.

140. If for 10s. 8d. I have 1 lb. of Spice, what Quantity can I have for 4d.? *Ans.* $\frac{1}{2}$ oz.

141. If for $26\frac{1}{4}$ d. I have $10\frac{1}{2}$ oz. what Quantity can I have for 8s. 4d. *Ans.* 2lb. 8oz.

142. If for 8s. 4d. I have 2lb. 8 oz. what Quantity can I have for $26\frac{1}{4}$ d. *Ans*w. $10\frac{1}{2}$ oz.

143 What.

143. What will $10\frac{1}{2}$ oz. cost, if 2lb. 8 oz. cost 8s. 4d.? *Ans.* $26\frac{1}{4}$ d.

144. At 18s. 8d. the Ct. what will $\frac{3}{4}$ of a lb. come to? *Ans.* $1\frac{1}{2}$ d.

145. If 1 Ct. cost 9s. 4d. what will $\frac{1}{2}$ lb. cost? *Ans.* $\frac{1}{2}$ d.

146. If 1lb. of Spice cost 3l. 12s. what will $6\frac{3}{4}$ Ounces come to? *Ans.* 1l. 10s. $4\frac{1}{2}$ d.

147. If 1 Ct. of Merchandizes cost 21s. what will 1lb. stand in? *Ans.* $2\frac{1}{4}$ d.

148. At 2s. 4d. the Ct. what is it a lb.? *Ans.* $\frac{1}{4}$ d.

—XXIII.—

149. Bought 3 Hhds. of Brandy, containing 61, 62, and $62\frac{1}{2}$ Gallons, at 6s. 8d. per Gallon, I demand how much it comes to? *Ans.* 61l. 16s. 8d.

Example.

Gal.	s.	d.	
1	6	8	61
2	12		62
			$62\frac{1}{2}$

			185 $\frac{1}{2}$

			371
			80

			29680

$\begin{array}{r} 2 \\ 29680 \end{array} \left\{ \begin{array}{l} 248 (8 \\ 14840 \\ 12222 \end{array} \right\} \begin{array}{l} 123 | 6 \\ \hline 611. : 16s. : 8d. \end{array}$

150. How

150. How much will 4 Pieces of Drugget come to, No. 1, containing 40¹ Yards, No. 2, 49¹/₂ Yards, No. 3, 47 Yards, No. 4, 45¹/₄ Yards, at 3s. 4d. the Yard? *Ans.* 30l. 6s. 8d.

151. Bought 4 Parcels of Butter, the first weighed 10 Ct. 3qrs. 27lb. The second 13 Ct. 0qrs. 11lb. The third 23 Ct. 2 qrs. 0lb. The fourth 19 Ct. 3 qrs. 14lb. at 16s. 8d. the Ct. What do they amount to? *Ans.* 56l. 2s. 11d.

152. Sold 4 Hhds. of Tobacco, No. 1, weighed 5 Ct. 2qrs. No. 2, 5 Ct. 1qr. 14lb. No. 3, 5 Ct. 0qrs. 7lb. No. 4, 5 Ct. 1 qr. 21lb. at 10¹/₂d. per lb. I demand what they amount to? *Ans.* 104l. 14s. 9d.

153. With how many Guineas of 23s. each, could I pay for 4 Hhds. of Brandy containing 62¹/₄, 63, 62³/₄, and 62¹/₂ Gallons, at the Rate of 5s. per Gallon? *Ans.* 54 Guineas, 11s. and 9d.

154. Bought 3 Hhds. of Sugar, No. 1, weighed 7Ct. 2qrs. 11lb. No. 2, 8Ct. 1qr. 10lb. No. 3, 9Ct. 1qr. 8lb. at 37s. 4d. per Ct. I demand how much they come to, and what a pound? *Ans.* the whole is 47l. 3s. and 11lb. stands in 4d.

—XXIV.—

155. Suppose a Bale of Merchandizes weighed 300lb. and cost 15l. 4s. 9d. pays for Duty 2d. per lb. for Freight 25s. for Porterage Home 1s. 6d. how much will 1lb. of those Merchandizes stand me in. *Ans.* 15¹/₄d.

Example.

Example.

First Cost———*l.* 15 : 04 : 9
 Duty,——— 02 : 10 : 0
 Freight,——— 01 : 05 : 0
 Portorage,—— 00 : 01 : 6
lb. ———— *lb.*

If 300———19 : 01 : 3—1 *Answ.* 15 $\frac{1}{4}$ d.

156. Received 4 Pipes of Oil, containing 480 Gallons, cost me 5s. 5 $\frac{1}{2}$ d. per Gallon; paid for Freight 4s. per Pipe, for Duty 6d. per Gallon, Portorage 1s. per Pipe. I demand the whole cost, and what it stands me in the Gallon? *Answ.* 144l. and is 6s. the Gallon.

157. Bought 100 raw Ox Hides, weight 98 Ct. 2qrs. at 23s. per Ct. paid for Salt 2l. 17s. 8d. for salting them, &c. 8s. 6 $\frac{1}{4}$ d. for Cellarage 1l. I demand the whole Cost, and what 1 Ct. stands in? *Answ.* 117l. 11s. 8 $\frac{1}{4}$ d. and is 1l. 3s. 10 $\frac{1}{2}$ d. per Ct.

158. Bought 200 Carcasses of Beef, weight nett 850Ct. 2qrs. at 6s. 6d. per Ct. and Salted them up in 400 Barrels, which cost 2s. 9d. per Barrel, paid for 50 Barrels of Salt at 20s. per Barrel, paid for Salting and Labourers, &c. 4l. 0s. 1d. Now I want to know what one Barrel stands me in? *Answ.* 19s. 3 $\frac{1}{4}$ d.

159. Shipped off 350 Casks of Butter, weight 546Ct. 2qrs. 14lb. cost 22s. 6d. per Ct. paid for Duty 6d. per Ct. Cooperage 2l. 16s. 0 $\frac{1}{2}$ d. Boat Hire 18s. Portorage, &c. 2l. 3s. 7d. Cellarage 3l. 4s. 7d. I demand what one hundred of the Butter stands me in on Board? *Answ.* 23s. 4d.

—XXV.—

160. Bought 3 Sorts of Brandy and an equal Quantity of each Sort, one Sort at 5s. per Gallon, the second at 6s. and the third at 7s. per Gallon, what is one Gallon worth one with another? *Answ.* 6s.

Example.

Gal.

1 ————— 5

1 ————— 6

1 ————— 7

————— Gal.
If 3 ————— 18 ————— 1

Answ. 6 Shillings.

161. Bought 3 Sorts of Vinegar, and an equal Quantity of each Sort, viz. of $3\frac{1}{4}$ d. 4d. and $4\frac{1}{4}$ d. the Quart, and mixed them together, what doth one Quart stand me in? *Answ.* 4d.

162. Bought 4 Sorts of Salt, and of each Sort 100 Barrels, viz. of 14s. 16s. 17s. and 19s. per Barrel, and mixed them together, what doth one Barrel cost me? *Answ.* 16s. 6d.

163. Paid for 4 Tuns of Tallow 120l. for 5 Tuns 150l. 5s. for 6 Tuns 192l. 10s. what doth one Tun stand me in one with another? *Answ.* 30l. 17s.

164. Bought 102 Barrels of Wheat which cost 62l. 4s. 140 Barrels cost 70l. 260 Barrels cost 143l. 18s. being all mixed, I demand the Price of one Barrel? *Answ.* 11s.

165. A

165. A Merchant bought 3 Sorts of Tobacco, viz. 100lb. at 6d. per lb. 120lb. at 10d. per lb. and 200lb. at 12d. per lb. which being mixed together, tell me how much 1lb. stands him in? *Answ.* 10d.

—XXVI.—

166. A Cashier has in divers Species 109l. 12s. for which he would have Crowns of 5s. 5d. and Ducatoons of 6s. but of each Sort an equal Number. How many of each must he receive? *Answ.* 192 of each.

Example.

$$\begin{array}{r}
 65 \\
 72 \\
 \hline
 \text{of each}
 \end{array}
 \quad
 \begin{array}{r}
 l. \quad s. \\
 109 : 12 \\
 20 \\
 \hline
 2192 \\
 12 \\
 \hline
 2 \\
 2267 \\
 26804 \\
 28777 \\
 288 \\
 1
 \end{array}$$

167. How many Reams of Paper of 9s. 9d. and 12s. 3l. the Ream, can I have of each Sort for 55l.? *Answ.* 50 Reams of each.

168. How many Guineas of 23s. and Pistoles of 18s. 6d. of each an equal Number, could I have for 996 Crowns of 5s. 5d.? *Answ.* 130 of each.

169. How

169. How do you prove the above Answer to be right?

170. A Vintner paid 171l. for 3 Sorts of Wine, viz. at 8l. 10s. at 9l. 5s. and at 10l. 15s. the Hhd. and had of each Sort an equal Quantity, I demand how much of each Sort he had? *Ans.* 6 Hhds.

171. Bought 3 Sorts of Salt, and of each Sort an equal Quantity, the Price at 14s. 16s. and 19s. the Barrel and the whole amounted to 490l. how many Barrels had I of each Sort? *Ans.* 200 Barrels.

—XXVII.—

172. A Merchant having bought certain Merchandizes for 1450l. with Condition to deduct 1 per Ct. for prompt payment, I demand how much he is to pay? *Ans.* 1435l. 10s.

Example.

100—1—14 50	1450 : 00 : 00
20	14 : 10 : 00
10 00	1435 : 10 : 00

173. How much must I pay of 1655l. deducting 1 per Ct. for prompt payment? *Ans.* 1638l. 9s.

174. How much must one pay of 912l. 10s. deducting 1 per Ct.? *Ans.* 903l. 7s. 6d.

175. How much are 1364l. 17s. 6d. deducting 1 per Ct.? *Ans.* 1351l. 4s. 6d. near enough for Merchants' Business, though in truth it is 1351l. 4s. 6³/₄d.

176. How much is 6050l. deducting $\frac{1}{2}$ per Ct.? *Ans.* 6019l. 15s.

177. How

177. How much must be paid instead of 815l. 12s. deducting for Commission $1\frac{1}{2}$ per Ct. ? *Ans.* 803l. 7s. $3\frac{2}{5}$ d.

178. What is 1537l. 17s. 8d. deducting $\frac{1}{2}$ per Ct. *Ans.* 1530l. 3s. $10\frac{2}{5}$ d.

179. How much must I pay of 1096l. 19s. 6d. deducting $\frac{1}{4}$ per Ct. ? *Ans.* 1094l. 4s. $7\frac{1}{2}$ d.

—XXVIII.—

180. A Captain of a Ship being provided with 24000lb. of Bread for 200 Seamen, of which each Man eats 4lb. per Week, how long will the Bread last ? *Ans.* 30 Weeks.

Example.

$$\begin{array}{rcl}
 200 & & \\
 \hline
 4 & \text{Weeks.} & \text{lb.} \\
 \hline
 \text{lb. } 800 & \text{---} 1 & \text{---} 24000 \\
 & \text{Ans. } 30 \text{ Weeks.} &
 \end{array}$$

181. How long would 3150lb. of Beef last for 25 Men, if they get $\frac{3}{4}$ lb. each, and that 3 Times a Week ? *Ans.* 56 Weeks.

182. A Fortrefs being provided with 184000lb. of Provisions and 700 Men, who consume each 5lb. a Week, how long can they subsist ? *Ans.* 52 Weeks and 4 Days.

183. Suppose 150 Seamen are provided with 984 Gallons and 3 Pints of Brandy for 7 Months, (each Month 30 Days) what is one Man's Share per Day ? *Ans.* $\frac{1}{4}$ of a Pint, or a Naggin.

189. Suppose 100Ct. 2qrs. 14lb. of Beef for Ships Use was to be cut up in pieces of 4lb. 3lb. 2lb. 1lb. and $\frac{1}{2}$ lb. and of each an equal Number, how many pieces of each would it make? *Answ.* 1073 and $3\frac{1}{2}$ lb. over.

—XXX.—

Questions to exercise the Rule of Three, promiscuously set down.

190. If 1lb. of Pepper cost 13d. and 1lb. of Sugar 14d. how much of each can I have for 4l. 1s. *Answer* 36lb.

191. A set out of a certain Town, and goes 9 Miles a Day; 7 Days after B sets out and goes 12 Miles a Day, I demand in how many Days B will overtake A? *Answ.* in 21 Days.

192. If a Tun of Tallow cost 35l. and is sold at the Rate of 10 per Ct. Profit, I demand for how much it is sold? *Answ.* 38l. 10s.

193. At what Rate must I sell the above Tallow, if I have a Mind to gain by 10 Tuns as much as one Tun cost? *Answ.* as above.

194. Suppose a Grey-Hound makes 27 Springs whilst a Hare makes 25, and the Springs are alike. Now if the Hare is 50 Springs before the Hound, would know in how many Springs the Hound will overtake her? *Answ.* 675.

195. If a Tun of Butter cost 37l. 10s. I demand at what Rate I must sell it, to gain by 15 Tuns as much as one Tun cost? *Answ.* 40l.

196. Bought 45 Barrels of Beef, at 21s. per Barrel, among which are 16 Barrels, whereof 4 are worth

worth but 3 of the rest: I demand how much I must pay? *Ans.* 43l. 1s.

197. In a besieged Fortrefs are 5000 Men provided with so much bread, that each Man may have 12 Ounces per Day. Now if 1000 are sent among them, I would know how many Ounces each Man then may have per Day? *Ans.* 10 Ounces.

198. If 5 and 3 make 10, how much make 6 and 8? *Ans.* $17\frac{1}{2}$.

199. Two Travellers set out at the same Time, and from the same Place, the one goes East 24 Miles a Day, and the other goes West 30 Miles a Day, in how many Days, (counting each Day 24 Hours) will they be 2150 Miles asunder? *Ans.* 39 Ds. 19 Hs. $33\frac{1}{2}$ Min.

200. How many Guineas of 23s. and Pistoles of 18s. 6d. of each an equal quantity, can I have for 186l. 15s.? *Ans.* 90.

201. If 1lb. of Sugar which cost 10d. is sold for $13\frac{1}{2}$ d. I demand the gain per Ct.? *Ans.* 35 per Ct.

202. How many Guineas of 23s. each would pay for 10 Pieces of Tapestry, each Piece $25\frac{1}{2}$ Yards long, and 4 Yards broad, at 15s. 8d. the square Yard? *Ans.* 694 Guineas and 18s.

203. If 112lb. of Tea cost 84l. 13s. 4d. at what Rate must it be sold a lb. to lose by the whole Parcel 10l.? *Ans.* 13s. 4d.

204. If I sell Goods at $13\frac{1}{2}$ d. the lb. I find to have gained 35 per Cent. I demand what the Goods were bought for? *Ans.* 10d. a lb.

205. A Gentleman has 510l. 8s. 4d. per Annum, I demand how much he may spend per Day,
H 2
if

if he has a mind to lay up yearly 100 Guineas at 23s. each? *Answ.* 21s. 8d.

206. For 20s. I bought 3 Sorts of Wine, the first for 8d. the second for 12d. and the third for 16d. the Quart, and I had of each Sort an equal Quantity, I demand how much it was? *Answ.* $6\frac{2}{3}$ Quarts.

207. A travels 12 Miles a Day, and when he has been gone 15 Days, B sets out after him; I demand how many miles in a Day B must go to overtake A in 60 Days? *Answ.* 15 Miles.

208. If in 4 Months I spend as much as I gain in 3 Months, how much can I lay up at the Year's end, if I gain every 6 Months 150l.? *Answ.* 75l.

209. If 840 Eggs are bought at the Rate of 10 a Penny, and 240 more at the Rate of 8 a Penny, and sold all at 18 for 2d. I demand whether Profit or Loss? *Answ.* 6d. Profit.

210. If a Piece of Cloth 30 Yards long, cost 15l. how much will a Dutch Ell come to if 3 Yards are equal to 4 Ells? *Answ.* $7\frac{1}{2}$ s.

211. If 2lb. of Pepper cost 25d. what will 6lb. of Cloves come to, if 3lb. of Cloves are worth 16lb. of Pepper? *Answ.* 16l. 13s. 4d.

212. How many Dozen of Gloves at 8d. the Pair will pay for 36 Dozen and 8 Pair of Stockings, at 3s. 6d. the Pair? *Answ.* $192\frac{1}{2}$ Dozen.

213. How much would a Piece of Plank come to of $5\frac{1}{4}$ Feet long, $2\frac{1}{2}$ Feet broad at one End, and $1\frac{1}{2}$ Feet broad at the other End, at 18d. the square Foot? *Answ.* 15s. 9d.

214. I bought

214. I bought a Parcel of Cloth at the Rate of 6s. for every two Yards, of which I sold a certain Quantity at the Rate of 18s. for every 5 Yards, and then I found to have gained as much as 18 Yards did cost. Now I demand how many Yards I sold? *Answ.* 90 Yards.

CHAP. IX.

Notation and Numeration of Fractions.

SECT. I.

A FRACTION or broken Number, is a Part or Parts of an Integer, it consists of two Parts or Numbers set one over the other, with a Line drawn between them, as $\frac{1}{2}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{13}{17}$, &c.

That below the Line is called the Denominator, because it denominates or shews the Parts any whole number is divided into, and the Number above the Line is called the Numerator, because it numbers or tells how many of those Parts the Fraction does consist of.

When the Numerator is less than the Denominator, the Fraction is less than Unity, and this is called a proper Fraction, as, $\frac{4}{5}$, $\frac{7}{8}$, $\frac{11}{12}$, $\frac{32}{43}$, &c.

When the Numerator is either equal to, or greater than the Denominator, it is called an improper Fraction, as $\frac{4}{4}$ is equal to 1, or $\frac{4}{3}$ is equal to $1\frac{1}{3}$.

Compound Fractions, or Fractions of Fractions, are such as consist of more than one Numerator and one Denominator, as $\frac{1}{2}$ of $\frac{3}{4}$ of $\frac{4}{7}$, and are always connected by the Word *of*.

A mixed Number is always written thus, $2\frac{1}{2}$, or $5\frac{3}{8}$, $7\frac{2}{5}$, &c.

CHAP. X.

Of Abbreviation of FRACTIONS.

TO abbreviate or reduce a Fraction to its least Terms, you must find the greatest common Divisor that will divide both the Numerator and Denominator without any Remainder, and the Quotient is a new Fraction of the same Value, and in its lowest Name or Terms.

Rule. Divide the Denominator by the Numerator, and then divide the last Divisor by the remainder, and so continue till nothing remains, then the last Divisor will be the greatest common Divisor sought, as suppose if $\frac{91}{117}$ was to be reduced, you'll find it to be equal to $\frac{7}{9}$ thus,

$$\begin{array}{rcl}
 \begin{array}{l} \overline{26} \\ 26 \end{array} \left\{ \begin{array}{l} 1 \\ 91 \end{array} \right. & \begin{array}{l} \overline{13} \\ 91 \end{array} \left\{ \begin{array}{l} 3 \\ 26 \end{array} \right. & \begin{array}{l} \text{com. } 13 \text{ divisor.} \\ 26 \left\{ \begin{array}{l} 2 \text{ --- } 91 \\ 13 \left\{ \begin{array}{l} 91 \\ 117 \end{array} \right. \end{array} \right.
 \end{array}$$

Abbreviate or reduce the following Fractions to their lowest name or least Terms.

$\frac{12}{16}$ is equal to $\frac{3}{4}$	$\frac{4}{48}$ equal to $\frac{1}{12}$
$\frac{5}{25}$ _____ $\frac{1}{5}$	$\frac{9}{36}$ _____ $\frac{1}{4}$
$\frac{24}{34}$ _____ $\frac{12}{17}$	$\frac{16}{64}$ _____ $\frac{1}{4}$
$\frac{45}{54}$ _____ $\frac{5}{6}$	$\frac{114}{285}$ _____ $\frac{2}{5}$
$\frac{144}{216}$ _____ $\frac{2}{3}$	$\frac{3619}{6251}$ _____ $\frac{11}{19}$

Abbreviate

Addition of Fractions.

Abbreviate or Reduce $\frac{59}{233}$ to its lowest Name.
Answ. There is no lower, as appears by the following work.

$$\begin{array}{ccccc} \overline{56} \left\{ \begin{array}{l} 3 \\ 233 \end{array} \right. & \overline{3} \left\{ \begin{array}{l} 59 \\ 56 \end{array} \right. & \overline{2} \left\{ \begin{array}{l} 18 \\ 36 \end{array} \right. & \overline{1} \left\{ \begin{array}{l} 3 \\ 2 \end{array} \right. & \left\{ \begin{array}{l} 2 \\ 2 \end{array} \right. \\ & & & & \end{array}$$

C H A P. XI.

ADDITION OF FRACTIONS.

S E C T. I.

OF Simple Fractions which have one common Denominator.

Rule 1. Add their Numerators together, and place the Sum over one of the given Denominators.

Example.

Add $\frac{3}{5}$ to $\frac{1}{5}$ *Answ.* $\frac{4}{5}$.
 Thus,

$$\begin{array}{r} \frac{1}{5} \\ + \frac{3}{5} \\ \hline \end{array}$$

Answ. $\frac{4}{5}$

Add the following Fractions together, viz.

$\frac{2}{7}$	and	$\frac{4}{7}$	the Sum is	$\frac{6}{7}$	$\frac{7}{24}$	$\frac{11}{24}$	and	$\frac{13}{24}$	Sum is	$1\frac{7}{24}$
$\frac{2}{9}$	and	$\frac{4}{9}$	_____	$\frac{2}{3}$	$\frac{11}{20}$	$\frac{7}{20}$	and	$\frac{9}{20}$	_____	$1\frac{7}{20}$
$\frac{3}{10}$	and	$\frac{1}{10}$	_____	$\frac{2}{5}$	$\frac{1}{4}$	$\frac{11}{44}$	and	$\frac{9}{14}$	_____	$1\frac{1}{2}$
$\frac{5}{12}$	and	$\frac{1}{12}$	_____	$\frac{1}{2}$	$\frac{15}{16}$	$\frac{13}{16}$	and	$\frac{11}{16}$	and	$\frac{7}{16}$
										$2\frac{7}{8}$
										---II.

—II.—

Of mixt Numbers with one common Denominator.

Rule 2. By Rule 1, add the fractional Parts and the Integers as in whole Numbers.

Example.

Add $17\frac{3}{5}$ to $12\frac{1}{5}$ *Answ.* $29\frac{4}{5}$

The Work.

$$\begin{array}{r} 17\frac{3}{5} \\ 12\frac{1}{5} \\ \hline \end{array}$$

Sum $29\frac{4}{5}$

Sums to be add, viz.

$13\frac{1}{5}$, $9\frac{4}{5}$, $3\frac{7}{5}$ and 5. The Sum is ———— $30\frac{4}{5}$
 $1\frac{1}{2}$, $2\frac{5}{2}$, $3\frac{7}{5}$, and $4\frac{1}{2}$, ———— 12
 $9\frac{1}{4}$, $7\frac{9}{4}$, $5\frac{5}{4}$, 16, 8, and $1\frac{1}{4}$, ———— $47\frac{5}{7}$

—III.—

To add Fractions which have no common Denominator.

This may be done two ways, viz.

Rule 3. Multiply all the Denominators together, and the Product will be a common Denominator, in which divide each particular Denominator, whose Quotient multiply by its Numerator, and these Products being added together, is a new Numerator to the common Denominator, and total Sum required.

Example

Example.

Add $\frac{3}{8}$, $\frac{5}{9}$ and $\frac{7}{12}$ together.

Com. 864 Denomi.

8	$\frac{3}{8}$	324
9	$\frac{5}{9}$	480
72	$\frac{7}{12}$	504
12		
864		1308

divide $\frac{1308}{864}$ equal to $1\frac{37}{72}$.

But it is best to find the least common Denominator, which will shorten the Work. Thus,

Rule 4. If there are two or more of the given Denominators that can be divided by any one Number, divide them, and if their Quotients are capable of being divided by any Number or in themselves, divide once more, and when you can divide no more, multiply the last Quotients by one another, and the Product multiply by the Divisor or Divisors, and you have the least common Denominator required.

Example.

As before, let $\frac{3}{8}$, $\frac{5}{9}$ and $\frac{7}{12}$ be added together.

Com. 72 Denomi.

$\frac{3}{8}$	-----	27
$\frac{5}{9}$	-----	40
$\frac{7}{12}$	-----	42
		109

Ans. $\frac{109}{72}$ equal $1\frac{37}{72}$ 18

The least Com. 72 Denomi.

Add.

Add the following fractions together, viz.

$\frac{5}{6}$ and $\frac{2}{3}$	the Sum is $1\frac{1}{2}$	$\frac{1}{3}$ $\frac{1}{5}$, $\frac{1}{6}$ $\frac{1}{7}$, and $\frac{1}{8}$	<i>Answ.</i> $\frac{271}{280}$
$\frac{3}{4}$ and $\frac{1}{12}$	$\frac{1}{3}$	$\frac{4}{5}$ $\frac{5}{6}$, $\frac{6}{7}$ $\frac{3}{8}$, and $\frac{1}{11}$	$3\frac{5477}{240}$
$\frac{1}{8}$ and $\frac{5}{6}$	$\frac{23}{24}$	$\frac{1}{5}$ $\frac{7}{6}$ $\frac{7}{2}$, and $\frac{5}{44}$	$\frac{6719}{7920}$
$\frac{3}{4}$ $\frac{5}{6}$, and $\frac{7}{8}$	$2\frac{11}{24}$	$\frac{1}{3}$ $\frac{1}{4}$, $\frac{1}{13}$, and $\frac{1}{25}$	$\frac{1049}{1300}$

—IV.—

The Use.

1. A Merchant bought 5 Pieces of Cloth, the first $40\frac{3}{4}$ Yards long, the second $38\frac{1}{2}$ Yards the third $40\frac{3}{8}$ Yards, the fourth $41\frac{1}{16}$ Yards, the fifth $42\frac{1}{4}$ Yards. I demand how many Yards there were in all? *Answ.* $202\frac{15}{16}$ Yards.

2. A nother Merchant sold 4 Bales of Spice, No. 1. wt. $150\frac{1}{2}$ lb. No 2 wt. $139\frac{3}{4}$ lb. No. 3, wt. $162\frac{2}{3}$ lb. No. 4, $170\frac{1}{8}$ lb. I demand how many lb. they weighed together? *Answ.* $623\frac{1}{4}$ lb.

3. A Grocer sold the following Parcels of Sugar, viz. $16\frac{1}{2}$ lb. $19\frac{1}{4}$ lb. $13\frac{3}{4}$ lb. $20\frac{3}{8}$ lb. $251\frac{1}{16}$ lb. $30\frac{5}{8}$ lb. and $11\frac{1}{4}$ lb. I demand how many lb. he sold in all? *Answ.* $362\frac{37}{8}$ lb.

CHAP. XII.

MULTIPLICATION OF FRACTIONS.

SECT. I

TO Multiply a Simple FRACTION by a Simple FRACTION.

Rule 1. *Multiply the Numerators together for a new Numerator, and the Denominators together for a new Denominator, and 'tis done.*

Example.

Example.

$\frac{3}{4}$ Multiplied by $\frac{5}{8}$ produces $\frac{15}{32}$.

Thus,

$$\begin{array}{r} 3 \text{ --- } 5 \\ \text{---} \\ 4 \text{ --- } 8 \\ \text{---} \end{array}$$

Product $\frac{15}{32}$.

Multiply the following Fractions.

$\frac{7}{12}$ by $\frac{5}{6}$	Product - $\frac{35}{72}$	$\frac{14}{15}$ by $\frac{5}{8}$	Product - $\frac{7}{12}$
$\frac{1}{4}$ by $\frac{2}{3}$	----- $\frac{1}{6}$	$\frac{128}{35}$ by $\frac{5}{12}$	----- $\frac{32}{84}$
$\frac{5}{8}$ by $\frac{4}{5}$	----- $\frac{1}{2}$	$\frac{13}{14}$ by $\frac{74}{75}$	----- $\frac{481}{525}$
$\frac{1}{4}$ by $\frac{1}{2}$	----- $\frac{1}{8}$	$\frac{314}{453}$ by $\frac{177}{316}$	----- $\frac{9263}{23858}$

— II. —

To multiply whole Numbers, by a Simple Fraction.

Rule 2. Make the Integer like a Fraction, by putting 1 under it, then proceed as before.

Example.

How much is 3 Times $\frac{1}{4}$? Answ. $\frac{3}{4}$.

Thus,

$$\begin{array}{r} 3 \text{ --- } 1 \\ \text{---} \\ 1 \text{ --- } 4 \\ \text{---} \end{array}$$

$\frac{3}{4}$

Sums to be multiplied.

5 by $\frac{1}{8}$	the Product is $\frac{5}{8}$	$\frac{7}{4}$ by $\frac{3}{4}$	Product $\frac{21}{16}$
18 by $\frac{2}{5}$	----- 4	16 by $\frac{5}{6}$	----- $13\frac{2}{3}$
48 by $\frac{5}{12}$	----- 20	34 by $\frac{15}{26}$	----- $31\frac{7}{8}$
8 by $\frac{2}{3}$	----- $5\frac{1}{3}$	100 by $\frac{13}{24}$	----- $54\frac{1}{6}$

— III. —

—III.—

To Multiply a mixed Number by a Simple Fraction, or a whole Number.

Rule 3. Reduce the mixt Number into an improper Fraction, by multiplying the integral Part by the Denominator of the Fractional Part, and to the Product add the Numerator of the said Fractional Part, the Sum is a Numerator to the former Denominator, then proceed as before.

Example.

If $4\frac{1}{2}$ are multiplied by 6, the Product is 27.

Thus,

$$\begin{array}{r} 4\frac{1}{2} \\ \hline 9 \text{ --- } 6 \\ \hline 2 \text{ --- } 1 \\ \hline \end{array}$$

$$\begin{array}{l} 54 \\ 22 \end{array} \left\{ \begin{array}{l} 27 \end{array} \right.$$

or Thus

$$\begin{array}{r} 6 \\ 4\frac{1}{2} \\ \hline 24 \\ 3 \\ \hline 27 \end{array}$$

Multiply the following Sums, viz.

8 by $5\frac{2}{3}$ Prod. $45\frac{1}{3}$	$\frac{3}{4}$ by $8\frac{1}{3}$ Prod. - - $6\frac{1}{4}$
$7\frac{1}{8}$ by 12 - - - $85\frac{1}{2}$	$12\frac{1}{2}$ by $\frac{3}{8}$ - - - $4\frac{1}{16}$
20 by $10\frac{7}{9}$ - - - $215\frac{5}{9}$	$\frac{1}{15}$ by $10\frac{1}{2}$ - - - $7\frac{7}{15}$
$5\frac{5}{6}$ by 100 - - - $583\frac{2}{3}$	$\frac{1}{16}$ by $30\frac{4}{5}$ - - - $28\frac{7}{8}$

—IV.—

To multiply mixt Numbers by mixt Numbers.

Rule 4. Reduce them into improper Fractions, by the 3d. Rule, and proceed as before.

Example.

Example.

How much is $5\frac{1}{2}$ Times $6\frac{3}{4}$? *Ans.* $37\frac{1}{8}$.

$$\begin{array}{r} 11 \quad 27 \\ 2 \quad 4 \\ \hline \end{array}$$

$$\begin{array}{l} 8(1) \\ 297 \\ 88 \end{array} \left. \vphantom{\begin{array}{l} 8(1) \\ 297 \\ 88 \end{array}} \right\} 37\frac{1}{8}$$

Multiply the following Sums, *viz.*

$37\frac{1}{3}$ by $3\frac{5}{6}$	Product	- - - - -	$143\frac{2}{3}$
$2\frac{1}{7}$ by $31\frac{1}{9}$	- - - - -	- - - - -	$92\frac{284}{323}$
$19\frac{4}{5}$ by $17\frac{7}{2}$	- - - - -	- - - - -	$338\frac{139}{180}$
$35\frac{1}{6}$ by $11\frac{17}{25}$	- - - - -	- - - - -	$418\frac{29}{150}$

—V.—

To multiply compound Fractions, observe the first Rule.

Example.

How much is $\frac{1}{2}$ of $\frac{3}{4}$ of $\frac{1}{5}$? *Ans.* $\frac{1}{40}$.

$1 \quad 1 \quad 1$	4
$2 \quad 4 \quad 5$	2
$\hline$	8
<i>Ans.</i> $\frac{1}{40}$	5
	40

I

Multiply

Multiply the following Fractions, viz.

$\frac{7}{8}$ of $\frac{1}{3}$ by $\frac{2}{5}$ the Product is	- - - - -	$\frac{7}{60}$
$\frac{1}{2}$ of $\frac{1}{4}$ by 16	- - - - -	2
$\frac{2}{5}$ of $\frac{3}{7}$ by $\frac{12}{12}$	- - - - -	$\frac{11}{70}$
$\frac{3}{4}$ of $\frac{1}{3}$ by $11\frac{7}{8}$	- - - - -	$2\frac{31}{32}$
$1\frac{2}{7}$ of $3\frac{4}{7}$ by 8	- - - - -	$11\frac{13}{17}$

—VI.—

The Use.

1. How many Pence are in $\frac{5}{6}$ of a Shilling?
Answ. 10d.

Example.

$$\begin{array}{r}
 s. \quad d. \\
 5 \text{ --- } 12 \\
 \hline
 6 \text{ --- } 1 \\
 \hline
 60 \left\{ \begin{array}{l} 10d. \end{array} \right.
 \end{array}$$

$$\begin{array}{r}
 s. \quad d. \\
 5 \quad 12 : 2 \\
 \hline
 6 \text{ --- } 1 \\
 \hline
 10d.
 \end{array}$$

2. How many Pence are in $\frac{2}{3}$ of a Shilling?
Answ. 8d.

3. How many Shillings are in $\frac{4}{5}$ of a l. Sterling?
Answ. 16s.

4. How much is $\frac{1}{8}$ of a Hundred Weight?
Answ. 14lb.

5. What is the Value of $\frac{11}{16}$ of a l. Sterling?
Answ. 13s. 9d.

6. How much is $\frac{2}{7}$ of a Hundred Weight? *Answ.*
 32lb.

7. What

7. What is the $\frac{5}{8}$ of a l. Sterling? *Ans*w. 12s. 6d.
 8. How much is the $\frac{5}{8}$ of a lb. Avoirdupois ?
*Ans*w. 10 oz.

—VII.—

9. What is the Value of $\frac{1}{4}$ of $\frac{3}{4}$ of a Shilling ?
*Ans*w. $2\frac{1}{4}$ d.

Example.

s. d.	or thus
$\begin{array}{r} 1 \text{ --- } 3 \text{ --- } 10 \\ \text{---} \quad \text{---} \\ 4 \text{ --- } 4 \text{ --- } 1 \\ \text{---} \quad \text{---} \end{array}$	$\begin{array}{r} 9 \text{ --- } 1 \\ \text{---} \quad \text{---} \\ 1 \text{ --- } 4 \\ \text{---} \quad \text{---} \end{array}$
$\frac{4}{36} \left\{ \begin{array}{l} 2 \frac{4}{16} = 2 \frac{1}{4} \text{d.} \end{array} \right.$	$\frac{1}{9} \left\{ \begin{array}{l} 2 \frac{1}{4} \end{array} \right.$

10. What is the Value of $\frac{7}{8}$ of $\frac{3}{4}$ of a l. Sterling ?
*Ans*w. 13s. $1\frac{1}{2}$ d.

11. How much is $\frac{3}{16}$ of $\frac{2}{3}$ of a l. Sterling? *Ans*w. 2s. 6d.

12. If one Yard of Cloth cost 17d. what will half a Quarter come to ? *Ans*w. $2\frac{1}{8}$ d.

13. What will $\frac{1}{3}$ of $\frac{3}{4}$ of an Ounce Avoirdupois, come to at 7s. the lb ? *Ans*w. $1\frac{5}{16}$ d.

—VIII.—

14. If one Yard of Cloth cost 2s. 6d. what will $2\frac{1}{2}$ Yards come to ? *Ans*w. 6s. 3d.

I 2

Example.

Example.

$$\begin{array}{r}
 \text{Yds.} \quad s. \\
 2\frac{1}{2} \quad 2\frac{1}{2} \\
 \hline
 5 \quad 5 \\
 \hline
 2 \quad 2 \\
 \hline
 \hline
 \end{array}$$

$$\begin{array}{r}
 1 \text{ s} \\
 \hline
 28 \left\{ \begin{array}{l} 6 \\ 4 \end{array} \right. \frac{1}{4} \\
 4
 \end{array}$$

$$\begin{array}{r}
 \text{Or thus,} \\
 2\frac{1}{2} \\
 2\frac{1}{2} \\
 \hline
 \hline
 \end{array}$$

$$\begin{array}{r}
 4 \\
 1\frac{1}{4} \\
 1 \\
 \hline
 6\frac{1}{4} s.
 \end{array}$$

15. What will $6\frac{1}{4}$ lb. of Indigo come to, at 5s. 6d. the lb.? *Ans.* 1l. 14s. $4\frac{1}{2}$ d.

16. If one Ounce of Silk cost $7\frac{3}{4}$ d. what will $3\frac{1}{4}$ Ounces come to? *Ans.* 2s. $1\frac{3}{6}$ d.

17. How much will 10 Yards, and half a Quarter of Cloth come to, at the Rate of $11\frac{3}{4}$ s. the Yard? *Ans.* 5l. 18s. $11\frac{5}{8}$ d.

18. How many square Feet are in a Plank of $20\frac{1}{2}$ Feet long, and 15 Inches broad? *Ans.* $25\frac{5}{8}$ Feet.

19. How many square Yards are in a Wainscot of 9 Feet 8 Inches high, and 15 Feet 3 Inches broad? *Ans.* 16 Yards $3\frac{5}{12}$ Feet.

—IX.—

20. What would the Workmanship of a Wall come to, of $60\frac{1}{2}$ Perches long, and $\frac{1}{4}$ Perch high at $8\frac{1}{2}$ d. the Perch? *Ans.* 10s. $8\frac{9}{4}$ d.

Example.

Example.

$$\begin{array}{r} 60\frac{1}{2} \\ \hline 121 \text{ --- } 1 \text{ --- } 17 \\ \hline \end{array}$$

$$2 \text{ --- } 4 \text{ --- } 2$$

$$4 \quad 121$$

$$2 \quad 17$$

$$\begin{array}{r} 8 \quad 847 \\ \hline \end{array}$$

$$2 \quad 121$$

$$\begin{array}{r} 16 \quad 43(9 \left\{ \begin{array}{l} 2087 \\ 2666 \\ 22 \end{array} \right. \quad \begin{array}{l} (8 \left\{ \begin{array}{l} s. \quad d. \\ 228 \\ 222 \\ 2 \end{array} \right. \end{array}$$

or this way,

$$60\frac{1}{2} \quad \left\{ \begin{array}{l} 15\frac{1}{8} \\ 8\frac{1}{2} \end{array} \right.$$

$$120$$

$$7\frac{1}{2}$$

$$1\frac{1}{16}$$

$$128\frac{9}{16}$$

$$22 \quad 10 : 8\frac{9}{16}$$

21. A Floor of $3\frac{1}{4}$ Yards broad, and $5\frac{1}{3}$ Yards long, being laid with Stones at the Rate of $5\frac{1}{2}$ s. the square Yard, what does it amount to? *Ans.* 4l. 15s. 4d.

22. How much would the painting of a wain-scotted Room come to, of 16 Feet square, and 11 feet high, at the Rate of $6\frac{1}{2}$ d. the square Yard? *Ans.* 2l. 2s. $4\frac{4}{5}$ d.

23. How much will an Oak Plank come to, of $20\frac{1}{2}$ feet long, $1\frac{1}{4}$ Foot broad at $6\frac{1}{2}$ d. the square Foot? *Ans.* 13s. $10\frac{9}{16}$ d.

24. How many Cubical Feet are in 100 Stones of 28 Inches long, 21 Inches broad, and 8 Inches thick? *Ans.* $272\frac{2}{9}$ Feet.

25. How many Cubical Feet are in a Beam of $22\frac{1}{4}$ Feet long, 13 Inches broad, and 8 Inches thick? *Ans.* $16\frac{5}{12}$ Feet.

I 3

26. What

26. What will $7\frac{1}{8}$ oz. of Silver come to, if 1 oz. cost $5\frac{1}{4}$ s. ? *Ans.* 1l. 17s. $4\frac{7}{8}$ d.

27. A has $\frac{1}{2}$ of a Ship, of which he sells to B $\frac{3}{4}$, and B sells out of his Share to C $\frac{5}{8}$, I demand what Share C has in the Ship, and also A and B's Shares ? *Ans.* A $\frac{1}{8}$, B $\frac{3}{8}$, and C $\frac{3}{8}$.

28. How many Tiles of 12 Inches square would lay a Floor of $15\frac{3}{4}$ Feet broad, and $17\frac{1}{4}$ long ? *Ans.* $271\frac{1}{2}$ Tiles.

29. Suppose a Marble Stone of $6\frac{1}{2}$ Feet long, $4\frac{3}{4}$ Feet broad, $2\frac{1}{3}$ Feet thick, was sold at the Rate of $5\frac{1}{2}$ s. the Cubical Foot ; I demand what it would amount to ? *Ans.* 19l. 16s. $2\frac{3}{4}$ d.

30. If 1 Ounce of Gold is worth 4l. what is 1 Grain worth ? *Ans.* 2d.

Note. The above Sum can be solved (the Stating the question excepted) by one Figure, which is the Answer.

CH A P. XIII.

SUBTRACTION OF FRACTIONS.

S E C T. I.

TO subtract Simple Fractions from Simple Fractions, which have one common Denominator.

Rule 1. Subtract the lesser Numerator from the greater, and under the Remainder put the Denominator.

Examples.

Example.

From	$\frac{5}{7}$	$\frac{5}{8}$	$\frac{11}{22}$	$\frac{15}{16}$	$\frac{17}{35}$	$\frac{105}{109}$
Take	$\frac{2}{7}$	$\frac{3}{8}$	$\frac{5}{22}$	$\frac{3}{16}$	$\frac{13}{35}$	$\frac{99}{209}$
Rest	$\frac{3}{7}$	$\frac{2}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{4}{35}$	$\frac{6}{209}$

—II.—

To subtract a Fraction, or mixt Number, from a whole Number.

Rule 2. *Take the Numerator from the Denominator, and under the Remainder put the Denominator, and carry one to be subtracted from the whole Number.*

Examples

From	1	3	6	10	9	100
Take	$0\frac{3}{5}$	$0\frac{1}{6}$	$0\frac{7}{8}$	$0\frac{1}{10}$	$5\frac{1}{2}$	$99\frac{9}{100}$
Rest	$0\frac{2}{5}$	$2\frac{1}{6}$	$5\frac{1}{8}$	$9\frac{9}{10}$	$3\frac{1}{2}$	$0\frac{1}{100}$

—III.—

To subtract mixt Numbers from mixt Numbers, having common Denominators.

Rule 3. *By Rule the first subtract the Fractional Part, and then subtract the Integer.*

Example.

From	$3\frac{2}{3}$	$100\frac{3}{4}$	$19\frac{1}{6}$	$97\frac{2}{4}$	$99\frac{2}{4}$
Take	$2\frac{1}{3}$	$10\frac{1}{4}$	$11\frac{7}{6}$	$9\frac{1}{4}$	$7\frac{1}{4}$
Rest	$1\frac{1}{3}$	90	$3\frac{1}{2}$	$88\frac{1}{4}$	$92\frac{1}{2}$

—IV.—

—IV.—

To subtract Simple Fractions which have no common Denominator.

Rule 4. *By the third or fourth Rule of the third Section of Addition of Fractions, find a common Denominator, in which divide each particular Denominator, whose Quotient multiply by its Numerator, and those Products subtract, and the Remainder is a new Numerator, to the common Denominator, and the Answer required.*

Example.

What diff. $\frac{2}{3}$ from $\frac{7}{9}$? *Ans.* $\frac{1}{9}$.

$$\begin{array}{r} 9 \\ \hline \frac{7}{9} \text{ ——— } 7 \\ \frac{2}{3} \text{ ——— } 6 \\ \hline 3 \qquad \frac{1}{9} \end{array}$$

Subtract the following Fractions.

From	$\frac{5}{8}$	$\frac{11}{12}$	$\frac{5}{6}$	$\frac{14}{15}$	$\frac{8}{15}$	$\frac{17}{21}$	$\frac{200}{216}$
Take	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{4}{5}$	$\frac{3}{5}$	$\frac{9}{20}$	$\frac{9}{14}$	$\frac{7}{144}$
Rest	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{30}$	$\frac{1}{3}$	$\frac{1}{12}$	$\frac{1}{6}$	$\frac{379}{432}$

—V.—

To subtract a Fraction or mixed Number from a mixed Number, when the fractional Part to be subtracted is greater than the fractional Part from which it is to be subtracted.

Rule 5. *Find a common Denominator, &c. as in the preceding Section, then add the new found Numerator of the lesser Fraction to the common Denominator*

nator, and from that Sum subtract the new found Numerator of the greater Fraction, and the Remainder set as a new Numerator over the common Denominator. then carry one to the Integral Part of the Subtrahend, and subtract, as in whole Numbers.

Example.

Subtract $2\frac{1}{3}$ from $5\frac{1}{4}$ remain $2\frac{11}{12}$

$$\begin{array}{r} 12 \\ \hline 5\frac{1}{4} \text{ --- } 3 \text{ and } 12 \text{ are } 15 \\ \phantom{5\frac{1}{4}} \phantom{\text{ --- }} 4 \\ \hline 2\frac{1}{3} \text{ --- } 4 \\ \hline 2\frac{11}{12} \end{array}$$

More Examples as before, viz.

From	$6\frac{5}{7}$	$10\frac{3}{15}$	$12\frac{5}{12}$	$19\frac{5}{11}$	$13\frac{7}{6}$
Tark	$0\frac{6}{7}$	$1\frac{7}{12}$	$6\frac{1}{2}$	$0\frac{7}{15}$	$9\frac{15}{7}$
Rest	$5\frac{6}{7}$	$8\frac{29}{48}$	$5\frac{11}{12}$	$18\frac{163}{65}$	$3\frac{5}{9}$

—VI.—

What differs $\frac{9}{14}$ from $\frac{17}{21}$? *Ans.* - - - - - $\frac{1}{6}$

What does $\frac{7}{144}$ differ from $\frac{209}{216}$? *Ans.* - - - $\frac{297}{216}$

What difference is there between $10\frac{7}{8}$ and $12\frac{1}{2}$? *Ans.* $1\frac{5}{8}$

Take $10\frac{1}{10}$ from $100\frac{1}{32}$ and there remain - - $89\frac{9}{64}$

What differs $\frac{9}{16}$ from $\frac{1}{3}$? *Ans.* - - - - - $\frac{11}{48}$

What does $\frac{9}{22}$ differ from $\frac{8}{15}$? *Ans.* - - - - - $\frac{1}{12}$

Note. If one cannot distinguish the greater of two Fractions, that whose Numerator being multiplied by the Denominator of the other Fraction, makes the greatest Number, is the greatest Fraction.

CH A P. XIV.

DIVISION OF FRACTIONS

S E C T. I.

To divide Simple Fractions.

RULE. I. *Set the Dividend to the left Hand of the Divisor, and multiply across, that is the Denominator of the Divisor by the Numerator of the Dividend, and the Product is a new Numerator, then multiply the Denominator of the Dividend by the Numerator of the Divisor, and the Product is a new Denominator.*

Example.

Divide $\frac{1}{4}$ by $\frac{3}{4}$, comes $\frac{4}{12}$ equal to $\frac{1}{3}$:
 Dividend Divisor Or thus,

$$\begin{array}{r} 1 \quad 3 \\ - \quad \times \quad - \\ 4 \quad 4 \end{array}$$

$$\begin{array}{r} 1 \quad 3 \\ - \quad \times \quad - \\ 4 \quad 4 \end{array}$$

$$\begin{array}{r} 4 \\ 4 \overline{) 1} \\ 32 \quad 3 \end{array}$$

$$\begin{array}{r} 1 \\ - \\ 3 \end{array}$$

More Examples of the same Nature.

$\frac{1}{5}$ by $\frac{2}{5}$ comes - - $\frac{1}{2}$	$\frac{3}{4}$ by $\frac{8}{9}$ comes - - $\frac{3}{27}$
$\frac{5}{9}$ by $\frac{8}{9}$ - - - - $\frac{5}{8}$	$\frac{1}{3}$ by $\frac{5}{6}$ - - - - $\frac{2}{5}$
$\frac{3}{4}$ by $\frac{1}{4}$ - - - - 3	$\frac{5}{6}$ by $\frac{5}{8}$ - - - - $1\frac{1}{2}$
$\frac{1}{5}$ by $\frac{9}{20}$ - - - - $\frac{4}{57}$	$\frac{2}{3}$ by $\frac{7}{27}$ - - - - $\frac{20}{45}$

— II.

—II.—

To divide a whole Number by a Simple Fraction, and the contrary.

Rule 2. *Make the whole Number an improper Fraction, by putting an Unit for a Denominator, and proceed as before*

Example.

Divide 4 by $\frac{1}{2}$ the Quotient is 8.
Dividend Divisor

$$\begin{array}{r} 4 \quad 1 \\ \hline 1 \quad 2 \\ \hline \end{array} \quad \begin{array}{r} 1 \\ 2 \end{array}$$

$$\left\} \begin{array}{l} 8 \\ 8 \end{array} \right.$$

Divide the following Fractions, viz.

$\frac{1}{2}$ by 4 comes - - $\frac{1}{8}$		1 by $\frac{1}{3}$ comes - - 3
8 by $\frac{3}{4}$ - - - - $10\frac{2}{3}$		$\frac{5}{6}$ by 15 - - - - $12\frac{1}{2}$
$\frac{3}{4}$ by 8 - - - - $\frac{3}{32}$		24 by $\frac{5}{8}$ - - - - $38\frac{2}{5}$
20 by $\frac{5}{6}$ - - - - 12		$\frac{5}{6}$ by 100 - - - - $120\frac{1}{6}$

—III.—

To divide a mixt Number by a Simple Fraction, and the contrary.

Rule 3. *Reduce the mixt Number into an improper Fraction, by Rule 3, of Multiplication of Fractions, and proceed as before.*

Example.

Example.

How often is $\frac{1}{2}$ contained in $2\frac{1}{2}$? *Answ.* 5 Times.

$$\begin{array}{r} 2\frac{1}{2} \\ \hline 5 \\ \hline 2 \end{array} \quad \begin{array}{r} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \quad \begin{array}{r} \hline 2 \end{array}$$

$$20 \left\{ \begin{array}{l} 2 \\ 2 \end{array} \right\} 5$$

or $2\frac{1}{2}$

$$\begin{array}{r} \hline 5 \\ \hline 2 \end{array} \quad \begin{array}{r} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \quad \begin{array}{r} \hline 1 \\ \hline 2 \end{array}$$

Answ. 5.

Divide the following Fractions, viz.

$3\frac{7}{8}$ by $\frac{3}{3}$	<i>Answ.</i> - - $8\frac{1}{3}$	$\frac{1}{2}$ by $\frac{3}{4}$	<i>Answ.</i> - - 6
$\frac{3}{4}$ by $4\frac{1}{2}$	- - - - $\frac{1}{6}$	$\frac{3}{8}$ by $3\frac{1}{8}$	- - - $\frac{3}{25}$
$12\frac{1}{9}$ by $\frac{5}{18}$	- - - - $43\frac{3}{5}$	$2\frac{2}{3}$ by $\frac{7}{8}$	- - - $2\frac{2}{3}$
$\frac{7}{8}$ by $2\frac{1}{3}$	- - - - $\frac{3}{8}$	$\frac{5}{14}$ by $2\frac{1}{7}$	- - - $\frac{1}{6}$

—IV.—

To divide a whole Number by a mixt Number and the contrary.

Rule 4. Reduce both the whole Number and mixt Number into improper Fractions, and proceed as before.

Example.

Divide 3 by $4\frac{4}{5}$, the Product is $\frac{5}{8}$.

$$\begin{array}{r} 3 \\ \hline 1 \end{array} \quad \begin{array}{r} \diagup \quad \diagdown \\ \diagdown \quad \diagup \end{array} \quad \begin{array}{r} 5\frac{4}{5} \\ \hline 24 \\ \hline 5 \end{array}$$

$$\begin{array}{r} 3 \\ \hline 24 \\ \hline 24 \end{array} \quad \begin{array}{r} 5 \\ \hline 5 \end{array}$$

Divide

Divide the following Fractions, viz.

7 by $8\frac{5}{8}$	Quotient - $\frac{56}{69}$	108 by $6\frac{3}{7}$	Quot. - $16\frac{4}{3}$
$5\frac{1}{2}$ by 5	- - - $5\frac{1}{10}$	$119\frac{1}{4}$ by 8	- - - $14\frac{29}{32}$
34 by $3\frac{7}{9}$	- - - 9	25 by $3\frac{1}{5}$	- - - $7\frac{13}{16}$
$1\frac{1}{9}$ by 15	- - - $0\frac{2}{27}$	$9\frac{3}{7}$ by 11	- - - $0\frac{6}{7}$

—V.—

To divide mixt Numbers by mixt Numbers.

Rule 5. Reduce them both into improper Fractions and proceed as before.

Example.

Divide $5\frac{1}{5}$ by $6\frac{1}{2}$, the Quotient is $\frac{32}{39}$

$$\begin{array}{r} 10 \quad 13 \\ \times \quad \times \\ \hline 3 \quad 2 \end{array}$$

Ans^w. $\frac{32}{39}$

Divide the following Sums, viz.

$9\frac{3}{4}$ by $13\frac{1}{2}$	Quotient $\frac{13}{18}$	$10\frac{5}{8}$ by $4\frac{2}{3}$	Quot. $2\frac{9}{8}$
$1\frac{1}{13}$ by $5\frac{5}{9}$	- - - $\frac{21}{100}$	$60\frac{9}{16}$ by $26\frac{1}{12}$	- - - $2\frac{1}{4}$
$6\frac{1}{2}$ by $5\frac{1}{3}$	- - - $1\frac{7}{12}$	$1\frac{1}{2}$ by $2\frac{1}{2}$	- - - $0\frac{3}{5}$

—VI.—

The Use.

1. What part is 9s. of a l. Sterling? Ans^w. $\frac{9}{20}$.

$$\begin{array}{r} \text{s.} \quad \text{s.} \\ 9 \quad 20 \\ \times \quad \times \\ \hline 1 \quad 1 \end{array}$$

Ans^w. $\frac{9}{20}$.

K

2. What

2. What Part of a l. Sterling is 15s? *Answ.* $\frac{3}{4}$.
 3. What Part of a lb. Troy is 4 oz.? *Answ.* $\frac{1}{3}$ lb.
 4. What Part of an Ct. is 84lb? *Answ.* $\frac{3}{4}$ lb.
 5. What Part of a Tun is 4 Ct.? *Answ.* $\frac{1}{5}$.
 6. What Part of a Shilling is 8d.? *Answ.* $\frac{2}{3}$.

—VII.—

7. What Part of a Shilling is $\frac{1}{2}$? *Answ.* $\frac{1}{24}$.

$$\begin{array}{r} d. \qquad d. \\ 1 \qquad 12 \\ \hline 2 \qquad 1 \\ \hline \end{array}$$

Answ. $\frac{1}{24}$.

8. What Part of a lb. is $\frac{3}{4}$ of an Ounce Avoirdupois Wt.? *Answ.* $\frac{3}{64}$.

9. What Part of a Penny is the $\frac{1}{2}$ of a Farthing? *Answ.* $\frac{1}{8}$.

10. What Part of a Shilling is $\frac{3}{4}$ d.? *Answ.* $\frac{1}{16}$.

11. What Part of a l. Sterling is $\frac{5}{8}$ s.? *Answ.* $\frac{1}{24}$.

12. What Part of a Ct. is $\frac{1}{4}$ lb.? *Answ.* $\frac{1}{448}$.

13. What Part of a lb. Troy is $\frac{1}{4}$ of an Ounce? *Answ.* $\frac{1}{48}$.

—VIII.—

14. What Part of a l. Sterling is 2s. 6d. *Answ.* $\frac{1}{8}$.

$$\begin{array}{r} 2\frac{1}{2}s. \\ \hline 5. \\ 8 \qquad 20 : 4 \\ \hline 2 \qquad 1 \\ \hline \end{array}$$

Answ. $\frac{1}{8}$.

15. What

15. What Part of a l. is 6s. 8d.? *Anfw.* $\frac{1}{3}$.
 16. What Part of a Shilling is $1\frac{1}{2}$ d.? *Anfw.* $\frac{1}{8}$.
 17. What Part of a l. is 3s. 4d.? *Anfw.* $\frac{1}{6}$.
 18. What Part of a l. is 12s. 6d.? *Anfw.* $\frac{5}{8}$.
 19. What Part is $1\frac{1}{2}$ Pint of a Gallon? *Anfw.* $\frac{3}{8}$.
 20. What Part is 8s. 9d. of a l.? *Anfw.* $\frac{7}{8}$.
 21. What Part is $5\frac{1}{4}$ d. of a Shilling? *Anfw.* $\frac{7}{8}$.

—IX.—

22. What Part is 6s. $2\frac{1}{4}$ of a l. Sterling?
Anfw. $\frac{149}{480}$.

Example.

$$\begin{array}{r}
 \text{s.} \quad \text{d.} \\
 6 : 2\frac{1}{2} \\
 12 \\
 \hline
 74\frac{1}{2} \\
 \hline
 \begin{array}{r}
 149 \quad \quad 240 \text{d.} \\
 \hline
 2 \quad \quad 1 \\
 \hline
 \end{array} \\
 \text{Anfw. } \frac{149}{480}.
 \end{array}$$

23. What Part of a l. Sterling is 11s. $4\frac{1}{2}$ d.?
Anfw. $\frac{91}{60}$.
 24. What Part is 3qrs. 7lb. of a hundred Wt.? *Anfw.* $4\frac{1}{8}$.
 25. What Part of a l. Sterling is 5s. $0\frac{3}{4}$ d.? *Anfw.* $\frac{81}{2320}$.

26. What Part is 2qrs. 8lb. of a Ct? *Ans.* $\frac{4}{7}$.
27. What Part of a Ct. is 4lb. $1\frac{1}{3}$ oz. Avoirdupois? *Ans.* $\frac{7}{192}$.
28. What Part of a lb. Troy is 7 pwt. and $3\frac{1}{2}$ Grains? *Ans.* $\frac{343}{11520}$.
29. What Part of a Yard is 1qr. $3\frac{1}{2}$ Nails? *Ans.* $\frac{15}{32}$.
30. What Part of a Tun is 7 Gallons $3\frac{1}{2}$ qrts. ? *Ans.* $\frac{7}{32}$.
31. What Part of a l. Sterling is nineteen Shillings and 11 pencethree Farthings? *Ans.* $\frac{979}{960}$.

C H A P. XV.

Questions to exercise Fractions, promiscuously set down.

1. **W**HAT Part is 176 of 368? *Ans.* $\frac{11}{23}$.
2. What Part of $148\frac{4}{5}$ is 124? *Ans.* $\frac{5}{6}$.
3. What Part is $28\frac{1}{2}$ of $33\frac{2}{3}$? *Ans.* $\frac{7}{8}$.
4. How many pwt. are in $\frac{5}{8}$ oz. and $5\frac{3}{4}$ pwt. Troy wt.? *Ans.* $18\frac{1}{4}$ pwt.
5. What differs $7\frac{3}{4}$ d. from $3\frac{1}{3}$ s. *Ans.* 2s. $8\frac{1}{4}$ d.
6. What will be left if I take $13\frac{5}{8}$ s. and $7\frac{5}{8}$ d. from 1l. Sterling? *Ans.* 5s. $6\frac{3}{8}$ d.
7. What Number is it, that when added to $\frac{1}{8}$, $\frac{1}{12}$ and $\frac{1}{18}$ together, will make $\frac{25}{37}$? *Ans.* $\frac{1097}{2884}$.
8. Which

8. Which of the two is the greater Fraction, $\frac{1}{2}$ or $\frac{1}{5}$? *Answ.* $\frac{1}{5}$ is the greater by $\frac{1}{10}$.

9. Of what Number is 176 the $\frac{1}{13}$ Part? *Answ.* 208.

10. How much is $\frac{5}{8}$ of $\frac{7}{9}$ of $\frac{3}{4}$ of 20 Shillings? *Answ.* $7\frac{7}{4}$ s.

11. Of what Number is $57\frac{5}{6}$ the $\frac{7}{8}$? *Answ.* of $66\frac{2}{3}$.

12. What Number is it, to which if you add $\frac{2}{3}\frac{3}{4}\frac{5}{8}$ and $\frac{7}{12}$ less $\frac{1}{10}$, the Sum shall be 2? *Answ.* $\frac{5}{10}$.

13. How often must I multiply $\frac{5}{9}$ by $\frac{3}{5}$, that the Product may be $\frac{4}{7}$? *Answ.* $1\frac{5}{7}$ Times.

14. By how much must I multiply $13\frac{2}{3}$ that the Product shall be $49\frac{1}{3}$? *Answ.* $3\frac{3}{5}$.

15. How much is $19\frac{5}{8}$ s. and $4\frac{1}{2}$ d.? *Answ.* 20s.

16. If the $\frac{5}{6}$ of a l. is 16s. 8d. how many Shillings are in 1l.? *Answ.* 20s.

17. How much is $\frac{3}{8}$ s. and $3\frac{2}{3}$ d.? *Answ.* $8\frac{1}{2}$ d.

18. How many Stones of $1\frac{3}{4}$ Foot long, $\frac{2}{3}$ Foot broad, and $\frac{3}{4}$ Foot thick. are equal to 50 Stones of $3\frac{1}{2}$ Feet long, $2\frac{1}{2}$ Feet broad, and $1\frac{1}{2}$ Foot thick? *Answ.* $571\frac{3}{7}$.

19. What will $\frac{1}{3}$ of $\frac{3}{4}$ of 2 pwt. of Silver come to, at 5s. $11\frac{3}{4}$ d. the oz? *Answ.* $11\frac{2}{3}$ d.

20. If one Yard of Flanders Lace cost 9s. $3\frac{1}{2}$ d. what will $5\frac{3}{4}$ Yard and 3 Nails come to? *Answ.*

21. 15s. $3\frac{3}{4}$ d.

22. Find two Numbers, so that the $\frac{1}{18}$ of the one will be as much as the $\frac{7}{6}$ of the other? *Answ.* 126 and 208, &c.

26. What Part is 2qrs. 8lb. of a Ct? *Anfw.* $\frac{4}{7}$.
27. What Part of a Ct. is 4lb. $1\frac{1}{3}$ oz. Avoirdupois? *Anfw.* $\frac{7}{92}$.
28. What Part of a lb. Troy is 7 pwt. and $3\frac{3}{4}$ Grains? *Anfw.* $\frac{343}{11520}$.
29. What Part of a Yard is 1qr. $3\frac{1}{2}$ Nails? *Anfw.* $\frac{15}{32}$.
30. What Part of a Tun is 7 Gallons $3\frac{1}{2}$ qrts.? *Anfw.* $\frac{7}{42}$.
31. What Part of a l. Sterling is nineteen Shillings and 11 pencethree Farthings? *Anfw.* $\frac{919}{960}$.

C H A P. XV.

Questions to exercise Fractions, promiscuously set down.

1. **W**HAT Part is 176 of 368? *Anfw.* $\frac{1}{2}$.
2. What Part of $148\frac{4}{5}$ is 124? *Anfw.* $\frac{5}{6}$.
3. What Part is $28\frac{1}{2}$ of $33\frac{2}{3}$? *Anfw.* $\frac{7}{8}$.
4. How many pwt. are in $\frac{5}{8}$ oz. and $5\frac{3}{4}$ pwt. Troy wt.? *Anfw.* $18\frac{1}{4}$ pwt.
5. What differs $7\frac{3}{4}$ d. from $3\frac{1}{3}$ s. *Anfw.* 2s. $8\frac{1}{4}$ d.
6. What will be left if I take $13\frac{5}{8}$ s. and $7\frac{5}{8}$ d. from 1l. Sterling? *Anfw.* 5s. $6\frac{3}{8}$ d.
7. What Number is it, that when added to $\frac{1}{8}$, $\frac{1}{12}$ and $\frac{1}{18}$ together, will make $\frac{25}{37}$? *Anfw.* $\frac{1097}{2664}$.
8. Which

8. Which of the two is the greater Fraction, $\frac{1}{12}$ or $\frac{1}{16}$? *Answ.* $\frac{1}{16}$ is the greater by $\frac{1}{48}$.

9. Of what Number is 176 the $\frac{1}{13}$ Part? *Answ.* 208.

10. How much is $\frac{5}{8}$ of $\frac{7}{9}$ of $\frac{3}{4}$ of 20 Shillings? *Answ.* $7\frac{7}{4}$ s.

11. Of what Number is $57\frac{5}{6}$ the $\frac{7}{8}$? *Answ.* of $66\frac{2}{3}$.

12. What Number is it, to which if you add $\frac{2}{3}\frac{3}{4}\frac{5}{6}$ and $\frac{7}{12}$ less $\frac{1}{16}$, the Sum shall be 2? *Answ.* $\frac{5}{16}$.

13. How often must I multiply $\frac{5}{9}$ by $\frac{3}{5}$, that the Product may be $\frac{4}{7}$? *Answ.* $1\frac{5}{7}$ Times.

14. By how much must I multiply $13\frac{2}{3}$ that the Product shall be $49\frac{1}{5}$? *Answ.* $3\frac{3}{5}$.

15. How much is $19\frac{5}{8}$ s. and $4\frac{1}{2}$ d.? *Answ.* 20s.

16. If the $\frac{5}{6}$ of a l. is 16s. 8d. how many Shillings are in 1l.? *Answ.* 20s.

17. How much is $\frac{3}{8}$ s. and $3\frac{2}{3}$ d.? *Answ.* $8\frac{1}{6}$ d.

18. How many Stones of $1\frac{3}{4}$ Foot long, $\frac{2}{3}$ Foot broad, and $\frac{3}{4}$ Foot thick. are equal to 50 Stones of $3\frac{5}{8}$ Feet long, $2\frac{1}{2}$ Feet broad, and $1\frac{1}{2}$ Foot thick? *Answ.* $57\frac{1}{7}$.

19. What will $\frac{1}{3}$ of $\frac{3}{4}$ of 2 pwt. of Silver come to, at 5s. $11\frac{3}{4}$ d. the oz? *Answ.* $1\frac{1}{16}\frac{2}{60}$ d.

20. If one Yard of Flanders Lace cost 9s. $3\frac{1}{2}$ d. what will $5\frac{3}{4}$ Yard and 3 Nails come to? *Answ.* 2l. 15s. $3\frac{3}{4}$ d.

21. Find two Numbers, so that the $\frac{1}{8}$ of the one will be as much as the $\frac{7}{16}$ of the other? *Answ.* 126 and 208, &c.

114 *The Rule of Three Direct in Fractions.*

22. A Merchant has $\frac{3}{4}$ Share in a Ship, and sells $\frac{1}{2}$ of his Interest therein for 250l. I demand the Value of the whole Ship, at that Rate? *Answ.* 1333l. 6s. 8d.

C H A P. XVI:

The Rule of Three Direct in Fractions.

S E C T. I.

Rule.

1. **A**s in the Rule of Three, in whole Numbers, so likewise in Fractions, let your first and last Number be of one Name.

2. Bring the Denominator of your first Number either under the second or last Number.

3. Bring the Denominator of the second and third Number (being multiplied into one another) under the first Number.

4. If there be any given mixt Numbers, multiply the Integral Parts by the Denominator, and take in the Numerator, and transpose the Denominators, as before.

If $\frac{1}{4}$ Yard cost $\frac{2}{3}$ s. what will $\frac{7}{8}$ of a Yard come to? *Answ.* $2\frac{1}{3}$ s.

Example.

116 *The Rule of Three in Fractions.*

6. If $\frac{4}{7}$ oz. Avoirdupois wt. cost $10\frac{1}{2}$ d. what cost $\frac{5}{4}$ lb.? *Ans.* 8s. 9d.

7. If $19\frac{1}{2}$ lb. cost $\frac{9}{10}$ l. what Quantity can I have for $\frac{5}{8}$ s.? *Ans.* $\frac{2}{3}$ lb.

8. What will $\frac{1}{2}$ Ct. come to, if $6\frac{3}{4}$ Ct. cost $21\frac{3}{4}$ l. *Ans.* 1l. 12s. $2\frac{2}{3}$ d.

9. If $\frac{1}{2}$ Ct. cost 32s. $2\frac{2}{3}$ d. what will $6\frac{3}{4}$ Ct. come to? *Ans.* $21\frac{3}{4}$ l.

10. How many Ct. can I have for $21\frac{3}{4}$ l. if $\frac{1}{2}$ Ct. cost 32s. $2\frac{2}{3}$ d.? *Ans.* $6\frac{3}{4}$ Ct.

11. If $\frac{1}{4}$ Ct. cost 1l. $1\frac{3}{4}$ s. how much can be bought for $38\frac{1}{4}$ s.? *Ans.* 1qr. $21\frac{7}{8}$ lb.

12. What will $1\frac{1}{2}$ Ct. of Pepper come to, if $15\frac{1}{4}$ lb. cost $12\frac{3}{8}$ s.? *Ans.* 6l. 16s. $3\frac{5}{8}$ d.

—III.—

13. If 1lb. of Silk cost $16\frac{2}{3}$ s. how many lb. can I have for $37\frac{1}{2}$ s.? *Ans.* $2\frac{1}{4}$ lb.

Example.

s.	lb.	s.
$16\frac{2}{3}$	— 1 —	$37\frac{1}{2}$
—		—
50		75
2		3
—		—
100		

$$\left. \begin{array}{r} 25 \\ 228 \\ 200 \end{array} \right\} 2\frac{1}{4}\text{lb.}$$

14. How

14. How many lb. of Pot Ashes can I have for 12 $\frac{1}{4}$ d. if 1lb. cost 1 $\frac{3}{4}$ d. ? *Answ.* 7lb.

15. If 1lb. of Coffee cost 2 $\frac{3}{4}$ s. how many lb. can I have for 38 $\frac{1}{2}$ s. ? *Answ.* 14lb.

16. If for 10 $\frac{1}{3}$ s. I buy 1 hundred of Oranges, how many hundred can I have for 105 $\frac{1}{2}$ s. ? *Answ.* 10 $\frac{1}{4}$ hundred.

—IV.—

17. If 1 Ounce of Silver cost 5 $\frac{2}{3}$ s. what will $\frac{3}{4}$ of an Ounce come to ? *Answ.* 4 $\frac{1}{4}$ s.

$$\begin{array}{r}
 \text{oz.} \qquad \qquad \text{s.} \qquad \qquad \text{oz.} \\
 1 \text{ --- } 5\frac{2}{3} \text{ --- } \frac{3}{4} \\
 1\frac{1}{2} \qquad \qquad \text{---} \\
 17 \\
 3 \\
 \text{---} \\
 3 \\
 8\frac{1}{2} \} 4\frac{1}{4} \\
 22
 \end{array}$$

18. What will $\frac{1}{4}$ Yard come to, if 1 Yard cost 13 $\frac{1}{2}$ s. ? *Answ.* 3 $\frac{3}{8}$ s.

19. If 1lb. of any thing cost 5 $\frac{1}{4}$ s. what will $\frac{7}{8}$ lb. come to ? *Answ.* 4s. 7 $\frac{1}{8}$ d.

20. How much will $\frac{1}{4}$ Ct. come to at the Rate of 15 $\frac{3}{4}$ s, the Ct. ? *Answ.* 3s. 11 $\frac{1}{4}$ d.

—V.—

21. If 1lb. of Spice cost $\frac{3}{4}$ s. how much will $\frac{7}{8}$ lb. come to ? *Answ.* 7 $\frac{7}{8}$ d.

lb.

	<i>s</i>	<i>lb.</i>
<i>lb.</i>	3	7
1	—	—
32	4	\$
		3

21
Anfw. — *s.* or $7\frac{7}{8}$
32

22. What will $\frac{1}{5}$ of a lb. cost at the Rate of $\frac{5}{8}$ s. the lb.? *Anfw.* 7d.

23. If 1 Ct. cost $\frac{8}{9}$ l. what will $\frac{3}{4}$ Ct. come to *Anfw.* $\frac{2}{3}$ l. or 13s. 4d.

24. What will half a Pint of Brandy cost, if a Gallon cost $\frac{1}{3}$ l.? *Anfw.* $\frac{1}{8}$ l. or 5d.

—VI.—

25. If for $\frac{9}{16}$ l. I have 1 Yard of Cloth, how many Yards can I have for $\frac{1}{2}$ l.

<i>l.</i>	<i>Yd.</i>	<i>l.</i>
9	—	15
	1	—
20		16
16		10
—		—
144		6

$\left. \begin{array}{r} 250 \\ 244 \end{array} \right\} 1\frac{1}{4}$ *Anfw.*

26. What will $\frac{5}{8}$ lb. cost, if $\frac{5}{6}$ lb. cost 1l.? *Anfw.* $\frac{3}{4}$ l. or 15s.

27. If for $\frac{8}{9}$ l. I have 1 Ct. how much can I have for $\frac{2}{3}$ l.? *Anfw.* $\frac{3}{4}$ Ct.

28. How

28. How many Ounces can I have for $\frac{8}{9}$ s. if 1 Ounce cost $\frac{2}{3}$ s. ? *Answ.* $1\frac{1}{3}$ oz.

—VII.—

29. If $\frac{3}{4}$ of a Yard of Cloth cost $\frac{2}{3}$ l. what will 1 Yard cost ?

Example.

7 ds.	l.	7 d.
3	2	1
—	—	—
4	8	
3	4	
—	—	

9 *Answ.* $\frac{3}{9}$ l. or 17s. 9d.

30. What will 1 Yard of any Thing cost, if $\frac{7}{8}$ of a Yard cost $\frac{1}{4}$ l. *Answ.* $1\frac{1}{4}$ l.

31. How much will 1 lb. cost, if $\frac{2}{3}$ lb. cost $\frac{7}{8}$ s. ? *Answ.* $1\frac{5}{8}$ s.

32. If 3 Penny wts. of Silver cost $\frac{3}{4}$ s. what is 1 Ounce worth ? *Answ.* 5s.

—VIII.—

33. If $\frac{3}{8}$ of a lb. cost 15d. what cost 1 lb ?

Example.

lb.	d.	lb.
5	15	1
—	—	—
6	6	

$\left. \begin{array}{l} 4 \\ 90 \\ 55 \end{array} \right\} 18d. \text{ *Answ.*}$

34. What will 1 Yard come to, if $\frac{3}{4}$ of a Yard cost 18d. ? *Answ.* 24d.

35. If

35. If half a Quarter of Flanders Lace cost 3s. what is that a Yard? *Answ.* 24s.

36. How much cost 1lb. of Spice, if $\frac{2}{3}$ lb. cost 7s.? *Answ.* 10½s. or 10s. 6d.

—IX.—

37. If 1 Tun of Tallow cost 35l. what costs $\frac{3}{4}$ of a Tun?

		<i>Tun.</i>
<i>Tun.</i>	<i>l.</i>	<i>Tun.</i>
1 ———	35 ———	3
4	3	4
		—————
		21
		208
		AA

} 26¼ *Answ.*

38. How much will half a Quarter of a Yard of Lace come to at 46d. the Yard? *Answ.* 5¾d.

39. If 1 Ounce of Silver cost 5s. how much costs $\frac{5}{8}$ of an Ounce? *Answ.* 3s. 1½d.

40. At 25s. per Ct. how much will $\frac{3}{4}$ of a Ct. cost? *Answ.* 18s. 9d.

—X.—

41. If 1 Yard of Linen Cloth cost $\frac{3}{4}$ s. what will 1 Piece containing 40 Yards cost? *Answ.* 30s.

	<i>s.</i>	
<i>Yd.</i>	3	<i>Yds.</i>
1 ———	40	
3	4	3
		—————
		320
		AA

} 30s.

42. What

42. What will 7lb. of Cloves cost, if 1lb. cost $\frac{3}{4}$ l.? *Ans.* 2l. 2s.

43. At $\frac{5}{6}$ l. per Yard, how much will 42 Yards cost? *Ans.* 35l.

44. If 1lb. of Sugar cost $\frac{2}{3}$ s. how much will 28lb. cost? *Ans.* 18s. 8d.

—XI.—

45. If 1 Yard of Cloth cost $6\frac{2}{3}$ s. how much will 789 Yards come to? *Ans.* 263l.

Example.

Yds.	s.	Yds.
1	6 $\frac{2}{3}$	789
3	—	20
	20	

2	526l0
28780	—
3300	263l.

46. What will 756l. of Indigo come to at $3\frac{1}{3}$ s. the lb.? *Ans.* 126l.

47. If 1lb. of Cotton cost $8\frac{1}{4}$ d. what will 112lb. come to? *Ans.* 3l. 17s.

48. How much will 650lb. come to at $3\frac{3}{4}$ s. the lb.? *Ans.* 121l. 17s. 6d.

—XII.—

49. How much will $\frac{1}{2}$ of $\frac{3}{4}$ Yards cost if $\frac{4}{9}$ Yards cost $\frac{7}{8}$ Ducatoons of 6s. each? *Ans.* 4s. $5\frac{5}{8}$ d.

50. If 3 Times $\frac{5}{6}$ Yards cost 4 Times $\frac{2}{3}$ s. what will 5 Times $\frac{3}{4}$ Yards cost? *Ans.* 4s.

L

51. What

51. What will $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{3}{8}$, less $\frac{1}{3}$ lb. come to, if $\frac{1}{3}$, $\frac{3}{4}$, and $\frac{5}{8}$, less $\frac{1}{6}$ lb. cost $\frac{1}{2}$, $\frac{2}{3}$, $\frac{1}{4}$, and $\frac{7}{8}$, less $1\frac{1}{6}$ Crowns at 5s. 5d. per Piece? *Ans.* $12\frac{59}{80}$ d.

52. A Merchant buys $37\frac{3}{4}$ Pieces of Cloth at $23\frac{1}{2}$ l. the Piece, pays in Ready Money $235\frac{1}{4}$ l. and the rest he is to pay in Wool at the Rate of $7\frac{2}{3}$ s. the Stone. I demand how many Stone of Wool he must deliver? *Ans.* $1700\frac{5}{6}$ Stone.

53. Two Pieces of Cloth containing both together $79\frac{3}{4}$ Yards, I demand how many Yards are in each Piece, if $\frac{2}{3}$ Yards of the one are as long as $\frac{3}{4}$ Yards of the other? *Ans.* $42\frac{1}{8}$ and $37\frac{9}{16}$ Yards.

54. How much will 2 Bags of Wool come to, No. 1, wt. $94\frac{3}{8}$ Stone, No. 2, wt. $305\frac{7}{8}$ Stone, at 10s. $6\frac{2}{3}$ d. per Stone, but $4\frac{1}{2}$ Stone of No. 2, are worth but $2\frac{1}{4}$ Stone of No. 1? *Ans.* 127 l. 10s. $4\frac{5}{8}$ d.

PRACTICE TABLE.

Parts of a <i>l</i> .	Parts of a <i>Ct</i> .	
<i>s.</i> <i>d.</i>	<i>lb.</i>	
10 : 0 are $\frac{1}{2}$	56 are $\frac{1}{2}$	
6 : 8 — $\frac{1}{3}$	28 — $\frac{1}{4}$	
5 : 0 — $\frac{1}{4}$	16 — $\frac{1}{2}$	
4 : 0 — $\frac{1}{2}$	14 — $\frac{1}{8}$	
3 : 4 — $\frac{1}{6}$	8 — $\frac{1}{4}$	
2 : 6 — $\frac{1}{8}$	7 — $\frac{1}{6}$	
2 : 0 — $\frac{1}{10}$	4 — $\frac{1}{8}$	
Of a Shilling	Of a $\frac{1}{2}$ <i>Ct</i> .	
<i>d.</i>	<i>lb.</i>	
6 are $\frac{1}{2}$	28 are $\frac{1}{2}$	
4 — $\frac{1}{3}$	14 — $\frac{1}{4}$	
3 — $\frac{1}{4}$	8 — $\frac{1}{2}$	
2 — $\frac{1}{6}$	7 — $\frac{1}{2}$	
1 $\frac{1}{2}$ — $\frac{1}{8}$		
1 — $\frac{1}{12}$	Of a $\frac{1}{4}$ <i>Ct</i> .	
	<i>lb.</i>	
	14 are $\frac{1}{2}$	
	7 — $\frac{1}{4}$	
	4 — $\frac{1}{2}$	
	3 $\frac{1}{2}$ — $\frac{1}{8}$	

CHAP. XVII.

PRACTICE.

SECT. I.

1. IF 1 Hundred of Butter cost 25s. 6d. what will $\frac{1}{2}$ a Hundred come to? *Ans*w. 12s. 9d.

L 2

Example.

Example.

$$\begin{array}{rcl}
 s. & & d. \\
 25 & : & 6 \\
 \hline
 12s. & 9d.
 \end{array}$$

2. What will $\frac{1}{4}$ of a Ct. come to, at the Rate of 29s. 6d. per Ct.? *Ans.* 7s. 4 $\frac{1}{2}$ d.

3. If 1 Yard of Cloth cost 8s. 6d. what will $\frac{1}{4}$ a Yard cost? *Ans.* 4s. 3d.

4. How much will 14lb. of Sugar cost, at the Rate of 45s. 6d. per Ct.? *Ans.* 5s. 8 $\frac{1}{4}$ d.

5. What will 7lb. be worth, if 1 Ct. cost 36s. 4d.? *Ans.* 2s. 3 $\frac{1}{4}$ d.

6. How much is $\frac{1}{8}$ Part of 2000l. 11s. 8d.? *Ans.* 250l. 1s. 5 $\frac{1}{2}$ d.

—II.—

7. If 1 Ct. of Madder cost 50s. what will $\frac{1}{4}$ Ct. be worth? *Ans.* 11l. 17s. 6d.

Example.

$$\begin{array}{rcl}
 l. & & s. \\
 2 & : & 10 \\
 & & \frac{3}{4} \\
 \hline
 \end{array}$$

2qrs. are $\frac{1}{2}$ — 1 : 5 : 0

1qr. is $\frac{1}{4}$ — 0 : 12 : 6

$$\hline
 \text{£} 1 : 17 : 6$$

8. What

8. What will 2qrs. 14lb. come to, if 1 Ct. cost 50s. ? *Answ.* 1l. 11s. 3d.

9. If 1 Ct. cost 46s. 6d. what cost 1qr. 14lb. ?
Answ. 17s. 5 $\frac{1}{4}$ d.

10. At 17l. 10s. 8d. the Tun, what will 3 Ct. 3qrs. cost ? *Answ.* 3l. 5s. 9d.

11. If 1 lb. of Silk cost 3l. 10s. how much will 120z. cost ? *Answ.* 2l. 12s. 6d.

12. What will 3qrs. 21lb. of Tallow come to, at the Rate of 27s. 8d. per Ct. ? *Answ.* 1l. 5s. 11 $\frac{1}{4}$ d.

—III.—

13. If 1lb. of Cloves cost 9s. 4. what is $\frac{1}{2}$ an Ounce worth ? *Answ.* 3 $\frac{1}{2}$.

Example.

s.	d.
9	4

$\frac{1}{2}$ oz. is $\frac{1}{32}$ lb. 0 : 3 $\frac{1}{2}$ d.

14. What will 3 $\frac{1}{2}$ lb. of Sugar come, at the Rate of 14s. 4d. the $\frac{1}{4}$ of a Ct. ? *Answ.* 1s. 9 $\frac{1}{2}$ d.

15. If 1 Yard of Flanders Lace cost 15s. 4d. what cost 1 Nail ? *Answ.* 11 $\frac{1}{2}$ d.

16. How much will $\frac{3}{4}$ of an ounce Avoirdupois come to, if 1lb. be worth 9s. 4d. ? *Answ.* 5 $\frac{1}{4}$ d.

17. At 23s. 4d. per Ct. what is $\frac{1}{2}$ of a lb. worth ?
Answ. 1 $\frac{1}{4}$ d.

L 3

18. At

18. At 18s. 8d. per Hundred, what comes $\frac{3}{4}$ of a lb. to? *Answ.* $1\frac{1}{2}$ d.

19. What will $\frac{1}{2}$ lb. cost, at the Rate of 9s. 4d. per Ct.? *Answ.* $\frac{1}{2}$ d.

20. If an Ounce of Gold be worth 4l. what is that a Grain? *Answ.* 2d.

—IV.—

21. At 4d. per lb. what will 112lb. come to? *Answ.* 1l. 17s. 4d.

Example.

lb.	Or thus,
112	lb.
d. <u> </u>	112
4 are $\frac{1}{3}$ 3)7 : 4	d. <u> </u>
<u> </u>	4 are $\frac{1}{60}$ l. 1 : 17 : 4
£.1 : 17 : 4	

22. What will 379lb. of Sugar come to, at the Rate of 6d. per lb? *Answ.* 9l. 9s. 6d.

23. If 1 Yard cost 3d. what would 5014 Yards cost? *Answ.* 62l. 13s. 6d.

24. How much will 758 Yards come to, at 2d. the Yard? *Answ.* 6l. 6s. 4d.

25. How much will 112lb. come to, at $1\frac{1}{2}$ d. the lb.? *Answ.* 14s.

26. What will 976lb. come to, at 1d. per lb.? *Answ.* 4l. 1s. 4d.

—V.—

27. If 1 Pound of any Thing cost 5d. what will 1 Ct. be worth? *Answ.* 2l. 6s. 8d.

Example,

Example.

lb.	Or thus,
112	112
d. <u> </u>	d. <u> </u>
4 are $\frac{1}{4}$ 37 : 4	5 are $\frac{1}{5}$ of a h. 2 : 6 : 8
1 is $\frac{1}{4}$ 9 : 4	
<u> </u>	
4 6 : 8	

$$\text{£. } 2 : 6 : 8$$

28. How much would 563 Yards cost, at 7d. the Yard? *Ans.* 16l. 8s. 5d.

29. How much will 112lb. come to, at 8d. the lb.? *Ans.* 3l. 14s. 8d.

30. If 1lb. cost 10d. how much would 795lb. cost? *Ans.* 33l. 2s. 6d.

31. At 11d. the Yard, how much cost 7576 Yards? *Ans.* 347l. 4s. 8d.

32. If 1lb. of tann'd Leather cost $6\frac{1}{2}$. what cost 94 Hides, weight 1000lb.? *Ans.* 27l. 1s. 8d.

—VI.—

33. If 1lb. of any Thing cost 1s. 3d. what will 9654lb. come to? *Ans.* 603l. 7s. 6d.

Example.

lb.	Or thus,
9654	9654
d. <u> </u>	d. <u> </u>
3 are $\frac{3}{4}$ s. 2413 : 6	15 are $\frac{1}{16}$ of a l. 603 : 7 : 6
<u> </u>	
1206 7 : 6	

$$\text{£. } 603 : 7 : 6$$

34. At 4s. the Ell, how much cost 7839 Ells? *Ans.* 1567l. 16s.

35. If

35. If 1lb. of any Thing cost 2s. 6d. what will 7753lb. cost? *Answ.* 969l. 2s. 6d.

36. What will 9654 Yards come to, at 3s. 4d. per Yard? *Answ.* 1609l.

37. How much will 500 Barrels of Barley come to at the Rate of 6s. 8d. per Barrel? *Answ.* 166l. 13s. 4d.

—VII.—

38. If 1 Hundred of Merchandize cost 7s. how much will 4563Ct. come to? *Answ.* 1597l. 1s.

Example.

	Ct.		Or thus,
	4563		4563
s.	<u> </u>		<u> </u>
5 are $\frac{1}{4}$ - -	1140 : 15		7
2 are $\frac{1}{10}$ - -	456 : 6		<u> </u>
	<u> </u>		3194 1
	£.1597 : 1		£1597 : 1

39. How much will 3215 Ells come to, at 6s. the Ell? *Answ.* 964l. 10s.

40. What will 7563lb. cost, if 1lb. costs 8s.? *Answ.* 3025l. 4s.

41. How much will 401Ct. come to, at 13s. per Ct? *Answ.* 260l. 13s.

42. If 1C. costs 16s. how much will 269Ct. come to? *Answ.* 215l. 4s.

43. What cost 2369Ct. at 19s. per Ct.? *Answ.* 2250l. 11s.

—VIII.—

44. If one Yard of Cloth costs 19s. 9d. what will 1400 Yards cost? *Answ.* 1382l. 10s.

Example.

$ \begin{array}{r} 1400 \\ 19 : 9d. \\ \hline 12600 \quad 3d. \text{ are } \frac{1}{3} \text{ of a } l. \\ \quad 1400 \\ 6 \text{ are } \frac{1}{2} \quad - \quad 700 \\ 3 \text{ are } \frac{1}{2} \quad - \quad 350 \\ \hline 276510 \\ \hline \pounds. 1382 : 10 \end{array} $	<i>Or thus,</i> $ \begin{array}{r} 1400 \\ 17 : 10 \text{ reduced} \\ \hline \pounds. 1382 : 10 \end{array} $
---	---

45. How much will 4563lb. come to, at 4s. 9d. the lb.? *Answ.* 1083l. 14s. 3d.

46. How much will 112lb. cost, at 6s. 9d. the lb.? *Answ.* 37l. 16s.

47. How much will 120Ct. cost, at 12s. 3d. per Ct.? *Answ.* 73l. 10s.

48. If 1lb. of Mace cost 15s. 7d. what will 1Ct. cost? *Answ.* 87l. 5s. 4d.

—IX.—

49. If 1lb. of Silk costs 3l. 15s. what will 5 $\frac{3}{4}$ Ounces cost? *Answ.* 1l. 6s. 11 $\frac{7}{8}$ d.

Example.

Practice.

Example.

			l.	s.	
			3	:	15
4 ox. are	$\frac{1}{4}$	-	0	:	18 : 9
1 - - is	$\frac{1}{4}$	-	0	:	04 : $8\frac{1}{4}$
$\frac{1}{2}$ - - is	$\frac{1}{2}$	-	0	:	02 : $4\frac{1}{2}$
$\frac{1}{4}$ - - is	$\frac{1}{2}$	-	0	:	01 : $2\frac{1}{2}$

£.1 : 06 : $11\frac{7}{8}$ or $\frac{1}{2}d.$
(near enough for Use.)

Note. In these, and the like Cases, Merchants take no Notice of such small Parts of a Penny as $\frac{1}{8}$ or $\frac{1}{16}$, nor is it fit for Use. Therefore, to be short, and to avoid unnecessary Work, one may, wherever the Fraction is less than $\frac{1}{4}d.$ put nothing; and if less than an $\frac{1}{4}d.$ put a $\frac{1}{4}$. and if less than $\frac{3}{4}$ put an $\frac{1}{2}d.$ and if less than 1. put $\frac{3}{4}$. Not that I give this to the Learner as a Precedent for the Questions here proposed; but that when he comes into Business, he shall not be tedious to himself or his Master. However, the Perfectness of the Art which I am to instruct Youth in, requires that every Question should be resolved without the least Fault.

50. What will $7\frac{7}{8}$ oz. of Spice come to, if 12s. 8d. are paid for 1lb. ? *Ans.* 6s. $2\frac{1}{2}\frac{3}{4}d.$

51. How much would 21lb. of Sugar cost, at the Rate of 54s. 4d. the Ct. ? *Ans.* 10s. $2\frac{1}{4}d.$

52. If 1 Ct. of Madder cost 47s. 6d. what will 7lb. come to ? *Ans.* 3s. $2\frac{2}{3}\frac{1}{2}d.$

53. What will $14\frac{3}{4}$ lb. come to, if 1 Ct. cost 27l. 10s. 6d. ? *Ans.* 3l. 12s. $5\frac{2}{3}\frac{1}{4}d.$

54. How much will 11lb. and $\frac{3}{4}$ of any Thing come to, at 7s. 6d. the $\frac{1}{4}$ Ct ? *Ans.* 3s. $1\frac{4}{5}\frac{3}{8}d.$

—X.

—X.—

55. What will $245\frac{1}{2}$ lb. of any thing come to, at 3s. 6d. the lb.? *Ans.* 42l. 19s. 3d.

Example.

lb.
245 $\frac{1}{2}$
3s. 6d.

2s. 6d. are $\frac{1}{8}$ 30 : 12 : 6
1 - - is $\frac{1}{16}$ 12 : 5 : 0
 $\frac{1}{2}$ lb. cost - 0 : 1 : 9

£.42 : 19 - 3

Or thus,
245 $\frac{1}{2}$
3s. 6d.

d. 735
6 are $\frac{1}{2}$ 122 : 6
 $\frac{1}{2}$ lb. cost 1 : 9

85|9 : 3

£.42 : 19 : 3

56. What cost 14 Ct. 3qrs. of any Thing, at 16s. 4d. per Ct.? *Ans.* 12l. 0s. 11d.

57. If 1 Ct. cost 18s. 6 $\frac{1}{2}$ d. how much will 101 Ct. 1qr. come to? *Ans.* 93l. 17s. 4 $\frac{1}{8}$ d.

58. What will 193 Ct. 3qrs. cost at the Rate of 17s. 9 $\frac{1}{2}$ d. per Ct.? *Ans.* 172l. 7s. 1 $\frac{5}{8}$ d.

59. What cost 203 Ct. 3qrs. of any Thing, at 16s. 5 $\frac{1}{4}$ d. per Ct.? *Ans.* 167l. 9s. 11 $\frac{1}{2}$ d.

60. What will 296 $\frac{1}{4}$ lb. of Indigo come to, at 5s. 6d. per lb.? *Ans.* 81l. 9s. 4 $\frac{1}{2}$ d.

61. If 1 dozen of Candles cost 3s. 3d. what will a Box qt. 5 $\frac{1}{2}$ dozen, come to? *Ans.* 17s. 10 $\frac{1}{2}$ d.

—XI.—

62. If 1 hundred of Butter cost 18s. 9d. what will 106 Ct. 3qrs. 14lb. come to? *Ans.* 100l. 3s. 10 $\frac{3}{4}$ d.

Example

Example.

$$\begin{array}{rcl} \text{Ct.} & \text{qrs.} & \text{lb.} \\ 106 & : 3 & : 14 \\ 18 & : 9 & \end{array}$$

848

106

$$\begin{array}{rcl} 6d. \text{ are } \frac{1}{2}s. & - & 53 \\ 3d. \text{ are } \frac{1}{2} & - & 26 : 6 \\ 2qrs. \text{ are } \frac{1}{2} \text{ Ct.} & - & 9 : 4\frac{1}{2} \\ 1qr. \text{ is } \frac{1}{2} & - & 4 : 8\frac{1}{4} \\ 14lb. \text{ are } \frac{1}{2} & - & 2 : 4\frac{1}{8} \end{array}$$

$$200|3 : 10\frac{7}{8}$$

$$\pounds.100 : 3 : 10\frac{7}{8}$$

53. What will 2061 Ct. 2qrs. 7lb. cost, at 16s. 6d. per Ct.? *Ans.* 1700l. 15s. 9 $\frac{3}{8}$ d.

64. What will 106 Ct. 3qrs. 14lb. come to at 9s. 4d. per Ct.? *Ans.* 49l. 17s. 6d.

65. If 1 Ct. costs 15s. 9d. how much will 26 Ct. 3qrs. 7lb. come to? *Ans.* 21l. 2s. 3 $\frac{2}{16}$ d.

66. If 1 Ct. costs 21s. 6d. how much will 306 Ct. 3qrs. 21lb. come to? *Ans.* 329l. 19s. 1 $\frac{7}{8}$ d.

67. If 1 oz. of Silver costs 5s. 6d. how much will 10lb. 6pwt. 14grs. cost? *Ans.* 33l. 1s. 9 $\frac{2}{4}$ d.

—XII.—

68. What will 432 Ct. 2qrs. 22lb. come to, at the Rate of 18s. 6d. per Ct.? *Ans.* 400l. 4s. 10 $\frac{17}{16}$ d.

Example.

Example.

Ct. qrs. lb.
432 : 2 : 22
18s. 6d.

3456
432
6d. are $\frac{1}{2}$ s. - - - 216
2qrs. are $\frac{1}{2}$ Ct. - - - 9 : 3
14lb. are $\frac{1}{4}$ - - - 2 : $3\frac{3}{4}$
7lb. are $\frac{1}{5}$ - - - 1 : $1\frac{7}{8}$
1lb. is $\frac{1}{7}$ - - - 0 : $1\frac{5}{56}$

800/4 : $10\frac{1}{2}\frac{7}{8}$

£. 400 : 4 : $10\frac{1}{2}\frac{7}{8}$

69. What will 951Ct. 2qrs. 27lb. cost, at 17s. 3d. per Ct. ? *Ans.* 535l. 7s $1\frac{5}{12}$ d.

70. What will 506Ct. 1qr. 11lb. come to, at 13s. 7d. per Ct. *Ans.* 343l. 17s. $10\frac{8}{11}\frac{5}{12}$ d.

71. What Will 499Ct. 3qrs. 25lb. cost, at 25s. 11d. per Ct. ? *Ans.* 647l. 17s. $7\frac{7}{11}\frac{5}{12}$ d.

72. At 19s. 9d. per Ct. how much will 109 Ct. oqrs. 15lb. come to ? *Ans.* 107l. 15s. $4\frac{8}{11}\frac{3}{12}$ d.

73. If 1Ct. cost 15s. 2d. what will 753 Ct. 1qr. 25lb. come to ? *Ans.* 571l. 7s. $8\frac{1}{8}$ d.

74. If 1lb. of Silk cost 3l. 6s. 5d. what will 80lb. 10 ozs. cost ? *Ans.* 267l. 14s. $10\frac{1}{4}$ d.

75. How much will 1095 Ct. oqrs. 5lb. come to, at the Rate of 17s. 6d per Ct. ? *Ans.* 958l. 3s. $3\frac{3}{8}$ d.

76. What will 231 Ct. oqrs. 1b. come to, if 1 Ct. cost 18s. 3d. ? *Ans.* 210l. 15s. $10\frac{1}{11}\frac{7}{12}$ d.

77. If 1lb. of Silver cost 3l. 4s. what will 100lb. 110z. come to? *Ans.* 322l. 18s. 8d.

78. If 1 Tun of Butter cost 19l. 19s. 6d. how much will 20 Tun, 19Ct. 3qrs. 14lb. come to? *Ans.* 419l. 7s. 0 $\frac{3}{8}$ d.

79. What will 10 Tuns, 17Ct. 3qrs. come to, at 25l. 10s. 9d. the Tun? *Ans.* 278l. 0s. 9 $\frac{3}{8}$ d.

80. What will 7 Yards, 3qrs. and $\frac{1}{2}$ qr. come to, at 6s. 9d. the Yard? *Ans.* 2l. 13s. 1 $\frac{7}{8}$ d.

81. If 1 Tun costs 21l. 15s. 6d. what cost 25 Tuns, 15Ct. 3qrs. 14 $\frac{1}{2}$ lb.? *Ans.* 561l. 13s. 3 $\frac{6}{224}$ d.

82. What will 15 Yards 1 $\frac{1}{2}$ Quarters of Cloth cost, if a Piece, containing 42 Yards, costs 38l. 17s. 6 $\frac{1}{2}$ d.? *Ans.* 14l. 4s. 7 $\frac{1}{2}$ $\frac{4}{24}$ d.

83. If 1Ct. cost 19s. 11 $\frac{3}{4}$ d. what will 11Ct. 3qrs. 27 $\frac{1}{2}$ lb. come to? *Ans.* 11l. 19s. 7 $\frac{1}{12}$ $\frac{2}{8}$ d.

84. What will 19 Tuns, 19Ct. 3qrs. 27 $\frac{1}{2}$ lb. come to, at 19l. 19s. 11 $\frac{3}{4}$ d. the Tun? *Ans.* 399l. 19s. 5 $\frac{6}{1792}$ $\frac{4}{16}$ p.

CHAP. XVIII.

TRET AND TARE.

ACCORDING to the Custom of the City of Cork, the Merchants allow 1 per Ct. that is 1lb. out of every 112lb. to be deducted from the Gross Weight of all Sorts of Merchandizes, except for Wool, Beef, Butter and Hides; and this they call Trett.

For Wool they deduct 8lb. for every 20 Stones, after the Tare is deducted.

For

For Butter they allow 2lb. at the Beam for every large Cask.

For raw Hides 4lb. per Price.

For Beef 8lb. per Carcass.

N. B. T A R E is the Weight of Casks, Bags, or whatever else the Goods are put in, the Weight whereof is often marked or branded on the outside of it.

S E C T. I.

1. **B** OUGHT 100 Carcasses of Beef, wt. gross 450 Ct. 2qrs. 23lb. Tret 8lb. per Carcass, and at 8s. 6l. per Ct. what is the neat wt. and what does it amount to? *Answ.* 188l. 10s. 3 $\frac{3}{8}$ d.

Example.

Gross	- -	450 : 2 : 23	100 Carcasses
Tret	- -	7 : 0 : 16	8
Neat	- -	443 : 2 : 7	16 Ct. qrs. lb.
		at 8 : 6 per Ct.	$\frac{16}{8} = 2$
			$\left\{ \begin{array}{l} 7 : 0 : 16 \\ 200 \\ 222 \end{array} \right.$

		3544
6d. are $\frac{1}{2}$	- -	221 : 6
2qrs. are $\frac{1}{2}$	- - -	4 : 3
7lb. are $\frac{1}{8}$	- - -	0 : 6 $\frac{3}{8}$
		37710 : 3 $\frac{3}{8}$

Answ. £. 188 : 10 : 3 $\frac{3}{8}$

2. What will 400 raw Hides come to wt. gross 306Ct. 3qrs. 15lb. Tret 4lb. per Hide, and at 19s. 10d. per Ct.? *Answ.* 290l. 3s. 2 $\frac{3}{8}$ d.

M 2

3. If

3. If 1 Ct. of Butter cost 21s. 6d. what will 250 Firkins cost, wt. gross 127 Ct. 2 qrs. 21 lb. Tare 11 lb. per Firkin? *Answ.* 110l. 17s. $4\frac{3}{8}$ d.

4. Sold 10 Casks of Merchandizes, wt. gross 33 Ct. 2 qrs. 15 lb. Tare 15 lb. per Cask, and at 23s. 4d. per Ct. what does it come to? *Answ.* 37l. 13s. $6\frac{1}{2}$ d.

5. Bought 150 large Casks of Butter, weight gross, 206 Ct. 3 qrs. 24 lb. Tare 30 lb. per Cask, and at 24s. 6d. per Ct. I demand what it comes to? *Answ.* 204l. 6s. 3d.

—II.—

6. Two Hhds. of Tallow weigh as follow: No. 1, wt. Gross, 10 Ct. 1 qr. 11 lb. Tare, 3 qrs. 20 lb. No. 2, 11 Ct. 0 qrs. 17 lb. Tare, 3 qrs. 14 lb. Tret, 1 per Ct. out of the gross, and at 30s. per Ct. what do they come to? *Answ.* 29l. 5s. $1\frac{1}{2}$ d.

Example.

	C.	qrs.	lb.		C.	qrs.	lb.
No. 1, wt.	10	1	11		Tare	0	3 : 20
No. 2, wt.	11	0	17	- - -		0	3 : 14

gross, 21 : 2 : 00

lb. : 3 : 6

per Ct. Tret, 0 : 0 : $21\frac{1}{2}$

21 : 1 : $6\frac{1}{2}$

Tare, 1 : 3 : 6

Neat, 19 : 2 : $0\frac{1}{2}$

at 30s. per Ct.

570

2 qrs. are $\frac{1}{2}$

15

$\frac{1}{2}$ lb. is $1\frac{1}{2}$

0 : $1\frac{1}{2}$

5815 : $1\frac{1}{2}$

Answ. £. 29 : 5 : $1\frac{1}{2}$

7. Sold

7. Sold 4 Hhds. of Sugar, weighing as follows :
 No. 1, wt. 7Ct. 3qrs. 16lb. Tare, 3qrs. 20lb.
 No. 2, 8Ct. 0qrs. 10lb. Tare 3qrs. 24lb. No.
 3, 7Ct. 2qrs. 26lb. Tare, 3qrs. 27lb. No. 4, 8Ct.
 2qrs. 18lb. Tare, 3qrs. 25lb. Tret, at 1 per Ct.
 and at 35s. 4d. per Ct. how much do they amount
 to? *Answ.* 49l. 17s. 5 $\frac{1}{2}$ d.

8. A Merchant has bought 4 Hhds. of Copperas,
 Weight as follows, viz. No. 1, 10Ct. 2qrs. 4lb.
 Tare, 3qrs. 4lb. No. 2, 11Ct. 0qrs. 10lb. Tare
 3qrs. 10lb. No. 3, 12Ct. 1qr. 0lb. Tare, 3qrs.
 14lb. No. 4, 11Ct. 2qrs. 14lb. Tare, 3qrs. 18lb.
 Tret, 1 per Ct. and at 8s. 6d. per Ct. how much
 do they come to? *Answ.* 17l. 14s. 3 $\frac{7}{12}$ d.

9. Four Casks of Raisins, Weight as follows : No.
 1, 1Ct. 3qrs. 25lb. Tare, 0qrs. 21lb. No. 2, 1Ct.
 3qrs. 20lb. Tare, 0qrs. 24lb. No. 3, 2Ct. 1qr.
 16lb. Tare, 0Ct. 1qr. 3lb. No. 4, 1Ct. 3qrs. 23lb.
 Tare, 0Ct. 0qrs. 25lb. Tret, 1 per Ct. and at
 30 $\frac{1}{2}$ s. per Ct. what do they amount to? *Answ.* 11l.
 os. 7 $\frac{1}{6}$ d.

10. What will 3 Bales of Coffee come to, No.
 1 wt. 2Ct. 3qrs. 12lb. Tare, 16lb. No. 2, 3Ct.
 1qr. 20lb. Tare, 19lb. No. 3, 3Ct. 1qr. 24lb.
 Tare, 18lb. Tret, 1 per Ct. and at 18l. 10s. per
 Ct. ? *Answ.* 170l. os. 2 $\frac{2}{3}$ d.

—III.—

11. What will 2 Bags of Merchandizes come to,
 No. 1, wt. 2Ct. 3qrs. 10lb. No. 2, 3Ct. 2qrs.
 18lb. Tret, 1 per Ct. Tare, 16lb. per Bag, and
 at 1s. 8d. per lb. ? *Answ.* 57l. 9s. 2d.

Example.

	Ct.	qrs.	lb.	lb.
No. 1,	2	3	10	Tare, 16
2,	3	2	18	16
		6	2	00
Tret,	0	0	6	$\frac{1}{2}$
		6	1	$21\frac{1}{2}$
Tare,	0	1	4	
Neat,		6	0	$17\frac{1}{2}$
				112
				689 $\frac{1}{2}$ at 1s. 8d. per lb.
6d. are $\frac{1}{2}$	344			6
2d. are $\frac{1}{3}$	114			10
$\frac{1}{2}$ lb. cost	4			10
				114 9 : 2
				£.57 9 : 2.

12. A Merchant has sold 3 Bags of Pepper. viz.
 No. 1, weighing 3Ct. 2qrs. 0lb. No. 2. 4Ct. 1qr.
 7lb. No. 3, 3Ct. 3qrs. 21lb. Tret, 1 per Ct. and.
 Tare 40lb. for each Bag, and at $14\frac{3}{4}$ d. per lb.
 neat, I demand how much it will come to? *Ans.*
 72l. 15s. $7\frac{1}{8}$ d.

13. Sold 4 Casks of Indigo, wt. gross 18 Ct. 2
 qrs. 0lb. Tret, 1 per Ct. Tare, 37lb. per Cask,
 and at 4s. 6d. per lb. what do they amount to?
Ans. 428l. 14s. 9d.

14. Twelve

14. Twelve Casks of Merchandizes, wt. 306Ct. 3qrs. 0lb. Tret, 1 per Ct. Tare, 35lb per Cask, and at $15\frac{1}{2}$ d. per lb. what do they amount to? *Answ.* 217l. 17s. $9\frac{3}{8}$ d.

15. Three Bags of Cocoa, wt. gross, 10Ct. 1qr. 14lb. Tret, 1 per Ct. Tare, 7lb. per Bag, and at $9\frac{3}{4}$ d. per lb. what do they come to? *Answ.* 45l. 18s. $7\frac{1}{2}$ d.

16. What will 4Hhds of Tallow come, to, No. 1, wt. 9Ct. 3qrs. 24lb. No. 2, wt. 10Ct. 2qrs. 16lb. No. 3, wt. 11Ct. 0qrs. 12lb. No. 4, wt. 9Ct. 3qrs. 4lb. Tret, 1 per Ct. and Tare, 3qrs. 6lb. per Hhd. and at 20l. 11s. per Tun? *Answ.* 38l. 19s. $1\frac{2}{12}\frac{2}{10}$ d.

—IV.—

17. Bought 3 Packs of Wool, wt. viz. No. 1 3Ct. 1qr. 12lb. No. 2, 3Ct. 3qrs. 7lb. No. 3, 3Ct. 2qrs. 15lb. Tare, 30lb per Pack, and Tret, 8lb. for every 20 Stone, and at 10s. 6d. per Stone, what do they come to? *Answ.* 35l. 16s. $7\frac{1}{2}$ d.

Example.

Tret and Tare.

Example.

No. 1 -- 3 : 1 : 12 Tare 30

2 -- 3 : 3 : 7 -- 30

3 -- 3 : 2 : 15 -- 30

10 : 3 : 6

90 are 3qrs. 6lb.

Tare, 0 : 3 : 6

10 : 0 : 0

7

Stone, lb.

If 20 - 8 - 70 come 28lb. is 1 Stone, 12lb.

Tret, 1 : 12

68 : 4

at 10s. 6d. per Stone,

6806d. are $\frac{1}{2}$ - 344lb. are $\frac{1}{4}$ - 2 : $7\frac{1}{2}$

716 : $7\frac{1}{2}$

Answ. £. 35 : 16 : $7\frac{1}{2}$

18. Sold 4 Packs of Wool, at 9s. 9d. per Stone, weighing, viz No. 1, 3Ct. 3qrs. 27lb. No. 2, 3Ct. 2qrs. 16lb. No. 3, 4Ct. 1qr. 10lb. No. 4, 4Ct. 0qrs. 6lb. Tare, 30lb. per Pack, and Tret, 8lb. for every 20 Stone. I demand what they come to? Answ. 49l. 15s. $2\frac{2}{3}\frac{2}{8}$ d.

19. Bought

19. Bought 5 Packs of Wool, weight, viz. No. 1, 4 Ct. 2qrs. 15lb. No. 2, 4 Ct. 2qrs. 0lb. No. 3, 3 Ct. 3qrs. 21lb. No. 4, 3 Ct. 3qrs. 14lb. No. 5, 4 Ct. 0qrs. 14lb. Tare, 28lb. per Pack, Tret, 8lb. Per every 20 Stone, and at 11s. 6d. per Stone, how much do they come? *Ans.* 77l. 15s. $8\frac{1}{2}$ d.

20. Sold 3 Packs of Wool, weight as follows : No. 1, 3 Ct. 1qr. 27lb. No. 2, 3 Ct. 2qrs. 16lb. No. 3, 4 Ct. 0qrs. 21lb. Tare, 29lb. per Pack, Tret 8lb. for every 20 Stone, and at 11s. 7d. per Stone, what do they come to? *Ans.* 41l. 13s. $7\frac{2}{3}\frac{1}{4}$ d.

—V.—

Of Tares and allowances per Hundred wt.

21. Fifty Casks of Butter, weight gross 202 Ct. 3qrs. 14lb. Tare, 20 per Ct. (that is 20lb. out of every 112lb.) what is the neat weight? *Ans.* 166 Ct. 2qrs. 16 $\frac{1}{2}$ lb.

Example.

Ct.	qrs.	lb.	Ct.	qrs.	lb.
202	3	14	Gross, 202	3	14
20			Tare, 36	0	25 $\frac{1}{2}$
		4040	Neat, 166	2	16 $\frac{1}{2}$
2qrs. are $\frac{1}{2}$		10			
1qr. is $\frac{1}{2}$		5			
14lb are $\frac{1}{2}$		2 $\frac{1}{2}$			
		4037 $\frac{1}{2}$	Ct.	qrs.	lb.
		2222	36	0	25 $\frac{1}{2}$
		12			

22. Ten

22. Ten Hhds. of Tallow, wt. gross 104 Ct. 2qrs. 5lb. Tare, 14 per Ct. what are they neat? *Answ.* 91 Ct. 2qrs. 14 $\frac{7}{8}$ lb.

23. Six Butts of Currants, wt. gross 58 Ct. 1qr. 18lb. Tare, 16 per Ct. what are they neat? *Answ.* 50Ct. 0qrs. 7 $\frac{3}{4}$ lb.

24. Four Hhds. of Sugar, wt. 43Ct. 3qrs. 21lb. Tare, 12 per Ct. what are they neat? *Answ.* 39Ct. 0qrs. 25 $\frac{3}{4}$ lb.

25. Three Chests of Sugar, weight gross, 38Ct. 3qrs. 24lb. Tare 18lb. per Ct. what are they neat? *Answ.* 32Ct. 2qrs. 22 $\frac{2}{4}$ lb.

26. Five Hhds. of Madder, wt. gross, 36Ct. 1qr. 19lb, Tare, 14 per Ct. what are they neat? *Answ.* 31Ct, 3qrs. 13 $\frac{1}{8}$ lb.

27. Eight Bags of Pepper, wt. 21Ct. 3qrs. 13lb. Tare, 4 per Ct. what are they neat? *Answ.* 21Ct. 0qrs. 9 $\frac{1}{2}$ $\frac{5}{8}$ lb.

CHAP. XIX.

EXCHANGE

SECT. I.

To reduce ENGLISH MONEY into IRISH.

A Merchant in *Ireland*, draws a Bill of Exchange for 150l. *English* Money, which he negotiates to a Banker, at 5 per Ct. advance, how much *Irish* Money is he to receive? *Answ.* 157l. 10s.

Example.

Of Exchange.

143

Example.

$\text{£. } 150 \quad \text{£. } 150 : 0 : \text{English.}$
 $5 \quad 7 : 10 : \text{Exchange.}$

7150 £. 157 : 10 : *Irish.*
20

10/00

270l. *English*, at 7 per Ct. how much *Irish*?
*Ans*w. 288l. 18s.

370l. *English*, at 9 per Ct. how much *Irish*?
Ans. 403l. 6s.

51ol. at 8 per Ct, what will it come to? *Ans.*
55ol. 16s.

955l. at 6 per Ct. what is it? *Anfw*, 1012l. 6s.

265l. at 4 per Ct. how much is it? *Ans*w. 275l. 12s.

—II.—

190l. 17s. 10d. English Money, at 5 per Ct.
how much Irish is it? *Ans.* 200l. 8s. 8s. $8\frac{7}{10}$ d.

Example.

$l. \quad s. \quad d.$
 $190 : 17 : 10 \quad \text{£. } 190 : 17 : 10 \text{ English.}$
 $\qquad \qquad \qquad 5 \qquad \qquad \qquad 9 : 10 : 10\frac{7}{12} \text{ Exchange.}$

£. 9/54 : 9 : 2 200 : 8 : 8 $\frac{7}{10}$ Irish,

10789
I 2

$$\begin{array}{r|l} d. 10 | 70 & 7 \\ \hline & 10 \end{array}$$

7501.

750l. 18s. 8d. at 7 per Ct. how much is it?
Answ. 803l. 9s. 11 $\frac{1}{2}$ d.

901l. 1s. 11d. at 8 per Ct. ? *Answ.* 973l. 3s. 8 $\frac{1}{5}$ d.

300l. 15s. 6d. at 9 per Ct. ? *Answ.* 327l. 16s. 10 $\frac{3}{5}$ d.

199l. 9s. 11d. at 11 per Ct. ? *Answ.* 221l. 8s. 9 $\frac{9}{10}$ d.

999l. 19s. 9d. at 3 per Ct. ? *Answ.* 1029l. 19s. 8 $\frac{9}{10}$ d.

—III.—

280l. *English* at 6 $\frac{1}{2}$ per Ct. advance, how much
Irish is it ? *Answ.* 298l. 4s. od.

Example.

	<i>l.</i>	<i>s.</i>	<i>d.</i>	
£.280	280	0	0	<i>English.</i>
6 $\frac{1}{2}$	18	4	0	<i>Exchange.</i>
1680	298	4	0	<i>Irish.</i>
140				
£.18/20				
20				
s.4/00				

506l. at 5 $\frac{1}{2}$ per Ct. ? *Answ.* 533l. 16s. 7 $\frac{1}{5}$ d.

709l. at 7 $\frac{3}{4}$ per Ct. ? *Answ.* 763l. 18s. 11 $\frac{2}{5}$ d.

956l. at 9 $\frac{1}{8}$ per Ct. ? *Answ.* 1043l. 4s. 8 $\frac{2}{5}$ d.

1015l. at 7 $\frac{3}{4}$ per Ct. ? *Answ.* 1093l. 13s. 3d.

250l. at 3 $\frac{7}{8}$ per Ct. ? *Answ.* 259l. 13s. 9d.

763l. at $6\frac{1}{4}$ per Ct.? *Answ.* 810l. 13s. 9.

—IV.—

309l. 15s. 4d. *English*, at $4\frac{1}{4}$ per Ct. advance, how much *Irish* is it? *Answ.* 322l. 18s. $7\frac{1}{2}$ d.

Example.

l. s. d.
309 : 15 : 4
4 $\frac{1}{4}$

1239 : 1 : 4
77 : 8 : 10

£.13|16 : 10 : 2
20

s. 3|30
12

d. 3|62 31
equal—
100 50

l. s. d.
309 : 15 : 4 *English*.
13 : 3 : $3\frac{1}{5}$ Exchange.

£. 322 : 18 : $7\frac{1}{2}$ *Irish*.

£.103 : 0 : 11, at $5\frac{1}{5}$ per Ct.? *Answ.* 108l. 10s. $9\frac{1}{2}$ d.

£.905 : 17 : 7, at $5\frac{1}{4}$ per Ct.? *Answ.* 953l. 8s. $9\frac{3}{8}$ d.

£.300 : 15 : 0, at $7\frac{1}{2}$ per Ct.? *Answ.* 323l. 6s. $1\frac{1}{2}$ d.

£.3014 : 16 : 0, at $3\frac{1}{4}$ per Ct.? *Answ.* 3109l. 0s. 3d.

£.460 : 19 : 9, at $5\frac{3}{4}$ per Ct.? *Answ.* 487l. 9s. $10\frac{1}{2}$ d.

N

£.315

£. 315 : 11 : 0, at $5\frac{3}{8}$ per Ct. *Answ.* 332l.
 10s. $2\frac{1}{2}\frac{19}{100}$ d.

£. 999 : 19 : 0, at $3\frac{7}{8}$ per Ct. ? *Answ.* 1038l.
 13s. $11\frac{1}{2}\frac{0}{100}$ d.

£. 680 : 15 : 5, at $7\frac{5}{8}$ per Ct. ? *Answ.* 732l.
 13s. $7\frac{1}{2}\frac{7}{100}$ d.

—V.—

£. 100 : 10 : $6\frac{1}{2}$, *English Money*, at $6\frac{1}{2}$ per Ct. advance, how much *Irish Money* is it ? *Answ.* 107l. 1s. $2\frac{2}{4}\frac{89}{100}$ d.

Example.

l. s. d.
 100 : 10 : $6\frac{1}{2}$
 $6\frac{1}{2}$

603 : 3 : 3
 50 : 5 : $3\frac{1}{4}$

£. 6|53 : 8 : $6\frac{1}{4}$
 20

s. 10|68
 12

d. 8|22 $\frac{1}{4}$

89 ~~100~~
 4 ~~1~~
 $\frac{89}{400}$

l. s. d.
 100 : 10 : $6\frac{1}{2}$
 6 : 10 : $8\frac{89}{400}$

Answ. 107 : 01 : $2\frac{2}{4}\frac{89}{100}$

£. 150 : 18 : $6\frac{3}{4}$ at $5\frac{1}{2}$ per Ct. *Answ.* 159l.
 4s. $7\frac{1}{8}\frac{0}{100}$ d.

£. 380.

- $\text{£.}380 : 15 : 9\frac{1}{2} \text{ at } 3\frac{3}{4} \text{ per Ct. ? Answ. } 39\text{sl.}$
 $1\text{s. } 4\frac{97}{100}\text{d.}$
 $\text{£.}400 : 0 : 6\frac{1}{4} \text{ at } 7\frac{1}{2} \text{ per Ct. ? Answ. } 43\text{cl. os.}$
 $6\frac{23}{100}\text{d.}$
 $\text{£.}519\text{l. } 19\text{s. } 11\frac{3}{4}\text{d. at } 6\frac{3}{4} \text{ per Ct. ? Answ. } 555\text{l.}$
 $1\text{s. } 11\frac{173}{1000}\text{d.}$
 $\text{£.}100 : 10 : 6\frac{1}{4} \text{ at } 5\frac{1}{8} \text{ per Ct. ? Answ. } 105\text{l.}$
 $13\text{s. } 6\frac{461}{1000}\text{d.}$

—VI.—

To reduce Irish Money into English.

A Merchant in London has a Bill of Exchange for 100l. Irish Money, which he sells or negotiates at 5 per Cent. that is, 105l. in Ireland, is worth 100l. in England. I demand how much English Money he is to receive? *Answ. 95l. 4s. 9 $\frac{1}{2}$ d.*

Example.

<i>Irish</i>	<i>English</i>	<i>Irish</i>
105	100	100
	20	
	2000	
	12	
	24000	
	100	
	2400000	

$$\begin{array}{r}
 967(1 \\
 3000(5 \\
 24000000 \\
 1088888 \\
 100000 \\
 111
 \end{array}
 \left\{
 \begin{array}{l}
 10(9 \\
 22887 \\
 12222 \\
 111
 \end{array}
 \right\}
 \begin{array}{r}
 19014 \\
 \hline
 95 : 4 : 9\frac{15}{105} \frac{1}{7}
 \end{array}$$

N 2

£160

£. 160 : 10 : 0, *Irish*, at 7 per Ct. how much *English*? *Answ.* 150l.

£. 545 : 14 : 0, *Irish*, at 7 per Ct. how much *English*? *Answ.* 510l.

£. 1093 : 13 : 3, at $7\frac{3}{4}$ per Ct. ? *Answ.* 1015l.

£. 323 : 6 : $1\frac{1}{2}$ at $7\frac{1}{4}$ per Ct ? *Answ.* 300l 15s.

£. 62 : 2 : 0 at $3\frac{1}{2}$ per Ct. ? *Answ.* 60l.

£. 100 : 0 : 0 at $5\frac{1}{8}$ per Ct. ? *Answ.* 95l. 2s. $5\frac{1}{8}\frac{1}{4}$ d.

£. 314 : 5 : 0 at $4\frac{3}{4}$ per Ct. ? *Answ.* 300l.

£. 259 : 13 : 9 at $3\frac{7}{8}$ per Ct. ? *Answ.* 250l.

— — VII. — —

To reduce Sterling Money into Flemish.

A Merchant at Antwerp has a Bill of Exchange to 100l. payable in London, which he negotiates at 33s. 4d. Flemish, for 1l. Sterling, I demand how much Flemish Money he is to receive? *Answ.* 166l. 13s. 4d. Flemish.

Example.

$$\begin{array}{rcl}
 \text{l.} & \text{s.} & \text{l.} \\
 1 & - 33\frac{4}{4} & - 100 \\
 3 & \underline{\hspace{1cm}} & \\
 & 100 & \\
 & 100 & \\
 \hline
 & &
 \end{array}$$

$$\begin{array}{l}
 \cancel{222} (1 \left\{ \begin{array}{l} 33313 \\ \hline 166 : 13 : 4 \end{array} \right. \\
 \cancel{20000} \\
 \cancel{0000}
 \end{array}$$

Or thus,

$$\begin{array}{r}
 \text{l. } 100 \\
 33\frac{4}{4} \\
 \hline
 3300 \\
 33\frac{4}{4} \\
 \hline
 33313\frac{1}{4} \\
 \hline
 166 : 13 : 9
 \end{array}$$

How

How many l. Flemish, are 279l. 8s. Sterling, at 33s. 4d. Flemish, per l. Sterling? *Ans*w. 465l. 13s. 4d.

In 150l. 10s. Sterling, at 33s. 6d. Flemish, per l. Sterling, how many l. Flemish? *Ans*w. 252l. 1s. 9d.

How many l. Flemish, are in 169l. 10s. 11d. Sterling, at 33s. 3d. Flemish, per l. Sterling? *Ans*w. 281. 17s. 4 $\frac{3}{4}$ d.

—VIII.—

To reduce Flemish Money into Sterling.

If 1l. Sterling is 33s. 4d. Flemish, how many l. Sterling are there in 166l. 13s. 4d. Flemish? *Ans*w. 100l.

Example.

s.	d.	Sterl.	l.	s.	d.
33	: 4	— 1 —	166	: 13	: 4
12			20		
400			3333		
			12		
			d. 40000 } 100l.		
			44000 }		

How many l. Sterling are equal to 465l. 13s. 4d. Flemish, at 33s. 4d. Flemish per l. Sterling? *Ans*w. 279l. 8s.

In 252l. 1s. 9d. Flemish, at 33s. 6d. how many l. Sterling? *Ans*w. 150l. 10s.

How many l. Sterling are in 199l. 19s. 11d. Flemish, at 33 $\frac{3}{8}$ s. per l. Sterling? *Ans*w. 119l. 16s. 11 $\frac{1}{2}$ $\frac{1}{6}$ $\frac{2}{7}$ d.

—IX.—

To reduce Guilders into Sterling Money.

How many l. Sterling are in 1000 Guilders, 10 Stivers, the Exchange at 33s 4d. Flemish, for 1l. Sterling? *Answ.* 100l. 1s.

Example.

s.	d.	l.	Gil.	Stiv.
33	4	—	1000	10
12			20	
400 Groot.			200	10
				2
			400 (20	{ 100 and 20 over.
			4000	{ 20
			400	{
			400	{ 1s.

NOTE, Each Gilder has 20 Stivers, and each Stiver 2 Groots or 16 Pennings, and each Shilling Flemish 12 Groots.

How many l. Sterling are equal to 1680 Guilders, at 33s. 3d. Flemish, per l. Sterling? *Answ.* 168l. 8s. $5\frac{7}{33}$ d.

In 2080 Guilders, 15 Stivers, at 34s. 9d. Flemish per l. Sterling, how many l. Sterling? *Answ.* 139l. 11s. $10\frac{22}{139}$ d.

At 33s. 11d. Flemish, per l. Sterling, I demand how many l. Sterling are in 6048 Guilders? *Answ.* 594l. 7s. $11\frac{213}{407}$ d.

In 2048 Guilders, 15 Stivers, at 34s. 5d. Flemish, per l. Sterling, how many l. Sterling? *Answ.* 198l. 8s. $6\frac{114}{198}$ d.

How

How many l. Sterling are in 10909 Guilders, 19 Stivers, at 34s. 7d. Flemish per l. Sterling? *Answ.* 1051l. 11s. 2 $\frac{6}{8}$ $\frac{2}{3}$ d.

In 1000 Guilders, at 33 $\frac{1}{7}$ s Flemish, per l. Sterling? how many l. Sterling? *Answ.* 100l.

—X.—

To reduce Pounds Sterling into Guilders.

How many Guilders are equal to 100l. Sterling, at 33s. 4d. Flemish per l. Sterling? *Answ.* 1000 Guilders.

NOTE, Each Gilder has 40 Groots.

l.	s.	d.	l.
1	—	33	4 — 100
		12	
—			
		400	
		100	
—			
		400000	} 1000
		44440	

How many Guilders are in 1409l. Sterling, if one l. Sterling is 33s. 8d. Flemish? *Answ.* 14230 Guilders, 18 Stivers.

In 100l. 10s. Sterling, at 33s. 9d. Flemish, per l. Sterling, how many Guilders? *Answ.* 1017 Guilders, 11 $\frac{1}{4}$ Stivers.

Tell me how many Guilders are in 1941l. 15s. 6d. Sterling, the Exchange at 33s. 11d. Flemish, per l. Sterling? *Answ.* 19757 Guilders, 11 Stivers, 3 $\frac{2}{5}$ Pennings.

At 34s. 5d. Flemish, per l. Sterling, I would know how many Guilders there are in 1597l. 9s. 11d. Sterling? *Answ.* 16494 Guilders, 2 Stivers, 14 $\frac{7}{10}$ Pennings.

—XI,

—XI.—

To reduce French Crowns into Pounds Sterling.

A Merchant is remitted a Bill of Exchange, from Paris, upon London. or any other Town in England or Ireland, for 1800 Crowns, at $32\frac{1}{2}$ d. Sterling per Crown; how many l. Sterling, does it come to?
Ans. 243l. 15s.

Example.

$$\begin{array}{r}
 1800 \\
 32\frac{1}{2} \\
 \hline
 3600 \\
 5400 \\
 900 \\
 \hline
 1096 \left\{ \begin{array}{l} 48715 \\ \hline 243 : 15s. \end{array} \right. \\
 58500 \\
 12
 \end{array}$$

How many l. Sterling, are equal to 1000 French Crowns, at $33\frac{1}{4}$ d. Sterling, per Crown? *Ans.* 138l. 10s. 10d.

In $126\frac{3}{4}$ Crowns, at $32\frac{1}{2}$ d. Sterling, per Crown how many l. Sterling? *Ans.* 171l. 1s. $11\frac{3}{4}$ d.

How many l. Sterling, are equal to $1037\frac{1}{4}$ Crowns, at 33d. Sterling for every Crown? *Ans.* 142l. 13s. $9\frac{3}{4}$ d.

In 1976 Crowns, 1 Livre, 4 Sols, at $32\frac{1}{2}$ d. Sterling, per Crown, how many l. Sterling? *Ans.* 267l. 12s. 9d.

At $33\frac{3}{4}$ d. Sterling, per Crown, how many l. Sterling, are in 1000 Crowns? *Ans.* 140l. 12s. 6d.

How

How many l. Sterling, are in 2822 Crowns, 2 Livres, 8 Sols, 4 Deniers, at 36d. Sterling, per Crown? *Answ.* 423l. 8s. 5d.

—XII.—

To reduce Pounds Sterling into French Crowns.

A Bill being drawn in London, or any other Town in England or Ireland, upon Paris, or any other part of France, for 243l. 15s. at 32½d. Sterling, per Crown; how many Crowns or Livres are to be paid for that Bill? *Answ.* 1800 Crowns, or 5400 Livres.

NOTE, A Crown is 3 Livres Tournois, a Livre is 20 Sols, and a Sol 12 Deniers.

Example.

d.	Crown	l.	s.
32½	— 1 —	243	: 15
65		20	
		4875	
		12	
		58500	
		2	
		82	
		117000	} 1800 Crowns.
		68	} 3
		5400	Livres

How many Crowns are equal to 138l. 10s. 10d. Sterling, at 33½d. per Crown? *Answ.* 1000 Crowns, or 3000 Livres.

In

In 171l. 1s. $11\frac{3}{4}$ d. Sterling, how many Crowns, at $32\frac{1}{2}$ d. Sterling, per Crown? *Answ.* $1263\frac{1}{2}$ Crowns or 3790 Livres, 10 Sols.

How many Crowns are in 142l. 13s. $9\frac{3}{4}$ d. Sterling, at 33d. Sterling, per Crown? *Answ.* $1037\frac{3}{4}$ Crown, or 3113 Livres, 5 Sols.

How many Crowns are there in 267l. 12s. 9d. Sterling, at $32\frac{1}{2}$ d. Sterling, per Crown? *Answ.* 1976 Crowns, 1 Livre, 4 Sols.

In 140l. 12s. 6d. Sterling, how many Crowns at $33\frac{3}{4}$ d. Sterling per Crown? *Answ.* 1000 Crowns.

How many Crowns, Tournois, are equal to 423l. 8s. 5d. Sterling, Exchange, at 36d. Sterling per Crown? *Answ.* 2822 Crowns, 2 Livres, 8 Sols, 4 Deniers.

—XIII.—

To reduce Hamburgh Money into Pounds Sterling.

A Bill being drawn at Hamburgh, upon London, or any other town in England or Ireland, for 3083 Marks, $12\frac{2}{3}$ Stivers Lubs, at 32s. 4d. gros for the l. Sterling, how much English Money will it come to? *Answ.* 254l. 6s. 8d.

Example.

Example.

s.	d.	l.	Marks, Stiv.
32	4	1	3083 : 12 $\frac{2}{3}$
12	Gros in a Mark		32 2
388 Gros			6166 25 $\frac{1}{3}$ Gros.
			9249
			98656
			add 25 $\frac{1}{3}$
(1			
(2			98681 $\frac{1}{3}$
(9			
$\left. \begin{array}{l} 9\$6\$1\frac{1}{3} \\ 3\$\$\$\$ \\ 3\$\$ \\ 3 \end{array} \right\} 254l. 6s. 8d.$			

NOTE, The remaining $129\frac{1}{3}$ multiply by 20, and the Product divide again by 388, and there will come 6s. then there will remain $258\frac{2}{3}$ which multiply by 12, and divide the Product again by 388, and there will come 8d.

In 2443 Marks, $9\frac{1}{2}$ Stivers Lubs, how many l. Sterling at 32s. 6d. Gros, per l. Sterling? *Answ.* 200l. 10s.

In 6763 Marks, $14\frac{3}{8}$ Stivers Lubs, at 32s. 9d. Gros, per l. Sterling, how many l. Sterling? *Answ.* 550l. 15s.

In 12093 Marks, 12 Stivers Lubs, at 32s. 3d. Gros, per l. Sterling, how many l. Sterling? *Answ.* 1000l.

How many l. Sterling, are in 4211 Marks, $1\frac{3}{8}$ Stivers Lubs, at 32s. 6d. Gros per l. Sterling? *Answ.* 345l 10. 6d.

—XIV.—

To reduce Pounds Sterling into Hamburgh Money.

A Bill of $254\frac{1}{3}$ l. Sterling, being drawn at London, or any other Town in England or Ireland, upon Hamburgh, at $32\frac{1}{3}$ Shill. Gros, per l. Sterling, how many Marks Lubs are to be paid for that Bill?

Ans. 3083 Marks $12\frac{2}{3}$ Stivers Lubs,

Example.

l.	s.	d.	l.
1	32	4	$254\frac{1}{3}$
	12		388
	388		2032
			2032
			762
			$129\frac{1}{3}$
			9868 $1\frac{1}{3}$ Gros.

2	{	
212		
98682		
32		
		8083 Mk. $12\frac{2}{3}$ Stiv. Lubs.

NOTE, The remaining $25\frac{1}{3}$ Gros, divide by 2, and they will be $12\frac{2}{3}$ Stivers.

How many Mark Lubs are equal to 200l. 10s. at $32\frac{1}{2}$ Shillings, gros, per l. Sterling? *Ans.* 2443 Mk. $9\frac{1}{2}$ Stiv. Lubs.

How many Mark Lubs are in 550l. 15s. Ster. at 32s. 9d. Gros, per l. Ster.? *Ans.* 6763 Mk. $14\frac{3}{8}$ Stiv. Lubs.

In 1000l. Sterling, at 32s. 3d. gros, per l. Ster. how many Mark Lubs? *Ans.* 12093 Mk. 12 Stiv. Lubs.

In 345l. 10s. 6d. Ster. at 32s. 6d. gros per l. Ster. how many Mark Lubs? *Ans.* 4211 Mk. $1\frac{3}{8}$ Stiv. Lubs.

—XV.—

To reduce Portugal Money into Pounds Sterling.

A Merchant has a Bill of Exchange for 850 \$ 500 Res, payable in Lisbon, which Bill he negotiates or sells at 5s. 4d. per Milre. I demand how many l. Sterling he is to receive? *Ans.* 226l. 16s.

Example.

850 \$ 500
5s 4d.

d.	4250	
4 are $\frac{1}{3}$ s.	- - - 283 : 4	
500 are $\frac{1}{2}$	- - - 2 : 8	

45316 : 0

£. 226 : 16 : 0

How many l. Sterling, in 1000 \$ 000 Res, at 5s. 6d. per Milre? *Ans.* 275l.

In 2000 \$, 000 Res, at 5s. 8 $\frac{1}{2}$ d. per Milre, how many l. ? *Ans.* 570l. 16s. 8d.

At 5s. 6 $\frac{1}{4}$ d. per Milre, how many l. will 2060 \$, 380. Res make? *Ans.* 573l. 0s. 10 $\frac{7}{8}$ d.

Tell me how many l. are in 1056 \$, 999 Res, at 5s. 4 $\frac{1}{4}$ d. per Milre? *Ans.* 282l. 19s. 4 $\frac{743}{1000}$ d.

—XVI.—

To reduce Sterling Money into Portugal Money.

How many Milres are equal to 226l. 16s. the Exchange at 5s. 4d. per Milre? *Ans.* 850, & 500 Res.

O

Example.

Example.

s.	d.	Res.	l.	s.
5	: 4	-----1000-----	226	: 16
12		20		

64

4536

12

54432

1000

323

34432000

6AAAAAA

66666

Res.

850 £ 500

In 275l. at 5s. 6d. per Milre, how many Milres?
Ans. 1000 £, 000 Res.

How many Milres are in 57cl. 16s. 8d. the
 Exchange at 5s. 8½d. per Milre? *Ans.* 2000 £
 000 Res.

At 5s. 10d. per Milre, how many Milres are in
 106l. 5s. 6¼d? *Ans.* 364 £, 375 Res.

—XVII.—

1. When the PAR of Exchange between Eng-
 land and Holland is at 33s. 4d. Flemish, per Pound
 Sterling, how much is a Gilder, of 20 Stivers,
 worth in London? *Ans.* 2s.

Example.

Example.

s. Flem.	s. Ster.	Stiv.
If $33\frac{1}{3}$	20	20
100		3
6		60
		20
600 Stivers.		
		2200 { 2 Shill.
		600 {
s. d.	s. Ster.	Stiv.
33 : 4	20	20
12		2
400 Groot.		40 Groot.
		20
		\$00 { 2 Shill.
		400 {

NOTE, *PAR*, in Trade or Commerce, is a Kind of Equality among Monies, or the Proportion a Person must give of one Kind of Species, to render it equivalent to a certain Quantity of another.

The *PAR* differs from the Course of Exchange in this, that the *PAR* of Exchange shews what one Nation should allow another in Exchange, which is certain and fixt; but the course of Exchange shews what they will allow in Exchange, which is uncertain being sometimes more, and sometimes less.

2. What is the Par of Exchange between England and Holland? that is how many Shillings Flemish, are equal to 20 Shillings sterling, when a Gilder, or 20 Stivers, is equal to 2 Shillings Sterling? *Answ.* $33\frac{1}{3}$ Shill, Flemish.

O 2

3. When

3. When the PAR of Exchange between France and England was at 54 Pence sterling per Crown, of 3 Livers Tournois, what ought the PAR to be when the Crown is raised, in France, to 5 Livers? *Answ.* $32\frac{2}{5}$ d.

4. What is the PAR of Exchange between England and Ireland, if a Guinea passes in England for 21 Shillings, and a Crown for 5 Shillings, and in Ireland the same Guinea goes for 22s. 9d. and the Crown for 5 Shillings and 5 Pence? *Answ.* $8\frac{1}{2}$ per Cent

5. If for 150l. English Money, there is paid 160l. 10s. Irish, what is the Exchange? *Answ.* 7 per Cent.

6. Whether is it better for a Merchant in Ireland, to have Crowns sent him from England; or to draw at 7 per Cent advance, when a Crown is 5s. in England, and 5s. 5d. in Ireland? *Answ.* 'Tis better to have Crowns sent him by $\frac{1}{3}$ per Cent.

7. When the Exchange from London to Lisbon is at $5\frac{1}{2}$ s. per Milre, and the Exchange between London and Cork is at $8\frac{3}{4}$ per Cent. advance, for Cork, how much is then a Milre worth at Cork? *Answ.* 5s. $11\frac{3}{4}$ d.

8. If for 1037 $\frac{3}{4}$ French Crowns there is paid in London 142l. 13s. 9 $\frac{3}{4}$ d. what is the Exchange? *Answ.* 33d. per Crown.

9. What is the Exchange if for 314l. 5s. Irish Money, there is paid in England 300l.? *Answ.* $4\frac{3}{4}$ per Cent.

10. When

10. When the Exchange between London and Rotterdam is $35\frac{3}{4}$ Shillings, Flemish per Pound sterling, how much is an English Crown of 5s. worth at Rotterdam? *Answ.* $53\frac{5}{8}$ Stivers.

11. If for 150l. 10s. Sterling there is paid 252l. 1s. 9d. Flemish, what is the Exchange? *Answ.* $33\frac{1}{2}$ s. Flemish per l. sterling.

12. At how much is the Exchange, when for 60l. English Money, there is paid 62l. 2s. Irish? *Answ.* $3\frac{1}{2}$ per Cent.

13. If a French Crown is worth at Rotterdam 2 Guilders, 8 Stivers, how much is that Crown worth at London, when the Exchange is at 35s. Flemish per l. sterling? *Answ.* $4\frac{4}{7}$ s.

14. If for 850 fl , 500 Res, there is paid in London 226l. 16s. how much is the Exchange? *Answ.* 5s. 4d. per Milre.

15. How much is the Exchange between Amsterdam and London, if a French Crown is worth at London, $4\frac{4}{7}$ s. Sterling, and at Amsterdam 48 Stivers? *Answ.* 35s. Flemish, per l. sterl.

16. When an English Shilling is worth 11 Stivers at Rotterdam, how much is the Exchange? *Answ.* $36\frac{2}{3}$ s. Flemish, per l. sterl.

17. When a Guinea at London is 21 Shillings and at Rotterdam 11 Guilders, 11 Stivers, whether is it better to send Guineas to Rotterdam, or remit Bills of Exchange, at $36\frac{2}{3}$ s. Flemish per l. sterling? *Answ.* 'Tis equal.

18. What is the Exchange between London and Hamburgh, when for 2443 Marks, $9\frac{1}{2}$ Stiver Lubs, there is paid in London 200l. 10s.? *Answ.* 32s. 6d. Gross Lubs, per l. sterl.

—XVIII.—

19. What is a Gilder worth at Cork, if the Exchange between London and Rotterdam is at 35s. Flemish, per l. sterling, and the Exchange from Cork to London at 9 per Ct. advance?

Ans. $2\frac{8}{105}s.$

Note, A Shilling Flemish is 6 Stivers.

Example.

s. Flem.	s.	Stiv.	
If 35	—20—	20	comes $1\frac{1}{2}s.$
l. Lond.	l. Cork.	s. Lond.	
100	—109—	$1\frac{1}{2}s.$	<i>Ans.</i> $2\frac{8}{105}s.$

Or thus.

Imagine two Columns, and in the first put any one of the given Numbers, and against it, in the second Column put its relative, then put in the first Column that which is of the same Name with the last of the second Column, and in the second Column put its relative, and so on, until the last in the second Column is of the same Name with the first in the first Column: For the Number sought put an () then multiply all the Numbers which stand under one another, continually together, and divide the Product of the Column which hath no (*) by the Product of the other Column, and the Quotient is the Answer required.*

Example.

	stiv.	
35s. Flem. or	210	l. London,
London, l. 100		109l. Cork,
how much at Cork*		20 Stiv. Rotterdam.

21000	2180
<i>Ans.</i> $\frac{2180}{21000}$ or $\frac{109}{1050}l.$	equal to $2\frac{8}{105}s.$

Or

Or thus,

London, l. 1		210 Stiv. Rotterdam,
Stiv. Rotterdam, 20		*how many l. Cork ?
Cork, l. 109		100l. London.

2180 21000
Ans. ——— l. equal to $2\frac{8}{105}$ s.
 21000

Or thus,

How many s. Cork*		20 Stiv. Rotterdam,
Stiv. at Rotterd. 210		11 London,
London, l. 100		*10 Cork

Ans. $2\frac{8}{105}$ s.

Or thus,

London, l. 100		109l. Cork,
How many s. Cork*		20 Stiv. Rotterdam,
Stiv. at Rotterd. 210		1 London,

Ans. $2\frac{8}{105}$ s.

Or thus,

Cork, l. 109		100l. London,
London, l. 1		210 Stiv. Rotterdam,
Stiv. at Rotterd. 20		*how many s. Cork.

Ans. $2\frac{8}{105}$ s.

20. When the Exchange between London and Cork is at 6 per Cent. advance for Cork, and the Exchange between London and Hamburgh at 33s. 4d. Gros. per l. Sterling. what is a Marks Lub worth at Cork ? *Ans.* 20 $\frac{44}{125}$ d.

21. How much would a French Livre of 20 Sols be worth at Cork when the Exchange between London

London and Paris, or any other Part of France, is at 34d. Sterling, per Crown of 3 Livres, and the Exchange between London and Cork at 5 per Cent. advance for Cork? *Answ.* $11\frac{9}{16}$ d.

22. When 105l. at Cork, are worth 100l. at London, and the Exchange between London and Paris at 36d. per Crown, of 3 Livres, or 60 Sols, how much are 12d. of Cork worth at Paris? *Answ.* $19\frac{1}{21}$ Sols.

23. What is a Gilder of 20 Stivers worth at Cork, when the Exchange between London and Rotterdam, is at 33s. 4d. Flemish, per l. Sterling, and the Exchange between London and Cork, at $8\frac{1}{3}$ per Cent. advance for Cork? *Answ.* 26.

24. When the Exchange between London and Cork is at $8\frac{3}{4}$ per Cent. advance for Cork? and the Exchange between London and Rotterdam is at 33s. 4d. Flemish, per l. Sterling, how much is 12 Pence of Cork worth at Rotterdam? *Answ.* $9\frac{17}{87}$ Stivers.

25. At how much ought the Exchange to be between London and Cork, to make the Money at a PAR, when a Crown in London is 5 Shillings, and the same Crown in Cork 5s. 5d.? *Answ.* $8\frac{1}{3}$ per Cent.

26. A Merchant in Lisbon owes to a Merchant in Cork 1000 £ 000 Res. I would know which is more advantageous to the Merchant in Cork, whether the Merchant in Lisbon sends him Moedores of 4000 Res a Piece, which pass in Cork for 29s. 3d. a Piece, or to have the Debt remitted to London at 6s. 6d. per Milre? and from London remitted

remitted to Cork, at 8 per Cent. advance for Cork?
Anfw. 'Tis more advantageous to have Moidores
 sent him by $4\frac{1}{8}$ per Cent.

27. A Merchant at Cork sends to Bourdeaux in
 France 100 Barrels of Beef, which stand him,
 clear of all charges, at Bourdeaux 22s. per Barrel, I
 would know for how many Livres they must be
 sold a Barrel at Bourdeaux to gain 20 per Cent. if
 the Money can be remitted to London at 36d.
 Sterling, per Crown and from London to Cork, at
 8 per Cent. advance for Cork? *Anfw.* For 24
 Livres, 8 Sols, $10\frac{2}{3}$ Deniers.

NOTE, *This question can be solved by 3 Figures
 besides the Stating.*

—XIX.—

28. If 4lb. of A, are as heavy as 3lb. of B, and
 5lb. of B, as 4lb. of C, and 6lb. of C, as 5lb. of
 D, how many lb. of D. are as heavy as 240lb. of
 A? *Anfw.* 120lb. of D.

Example.

A 4		3 B
B 5		4 C
C 6		5 D
How many of D*		240 A

~~220~~ ~~24400~~ { 120lb. of D

NOTE, *All the numbers that are the same in the
 first Column with those in the second may be cancelled
 in both, which will oftentimes save much Labour.*

As

As Thus,				Or Thus,			
A	4	3	B	A	4	3	B
B	8	4	C	B	8	4	C
C	6	8	D	2 C	6	8	D
D	*	240	A	D	*	240	A
6 720				120 <i>Ans.</i> 120			

29. If 112lb. of Pewter at London cost 3l. 15s. how many Stivers will 1lb. cost at Rotterdam, if 100l. at Rotterdam are equal to 110l. at London, and the Exchange at 35 Shillings Flemish per l. Sterling? *Ans.* $7\frac{47}{64}$ Stivers.

30. If 3 Yards of Cloth cost as much as $3\frac{3}{4}$ of Ratteen, and $4\frac{1}{2}$ Yards of Ratteen are worth 5 Yards of Drugger, how many Yards of Drugget are worth 27 Yards of Cloth? *Ans.* $37\frac{1}{2}$ Yards.

31. If 3 Yards in London, are equal to 4 Ells in Holland, and 50 Ells in Holland cost 26l. Flemish, how many l. Flemish, will 40 Yards, in London, come to? *Ans.* $27\frac{1}{15}$ l. Flemish.

32. What will 1lb. of Pepper cost if 3lb. of Cloves cost as much as 6lb. of Pepper, and $2\frac{1}{2}$ lb. of Cinnamon cost as much as 4lb. of Cloves, and 3lb. of Cinnamon cost 8 Shillings? *Ans.* 10d.

—XX.—

33. If 102lb. at Rotterdam are 112lb. in Cork, and a Tun of Tallow cost at Cork, 27l. and the Exchange from Cork to London, is 8 per Cent. advance,

advance, and the Exchange from London to Rotterdam at 34s. Flemish, for 1l. Sterling, I demand how many Guilders 100lb. of that Tallow will stand in at Rotterdam, without Freight or any other Charges? *Answ.* 12 Guilders, 10 Stivers.

Example.

1b. Rotterdam,	102		112lb. Cork,
1b. Tallow,	2240		27l. Cork,
1. Cork.	108		100l. London,
1. London,	1		34s. Flemish,
What will	*		100lb. Rotterdam.

$$24678\$40 \left\{ \begin{array}{l} (16450560 \\ 1028260000 \end{array} \right\} 4\frac{1}{6} \text{ Shill}$$

$$\begin{array}{r} \text{over } 16450560 \\ 6 \end{array} \quad \begin{array}{r} 24/6 \text{ Stiv.} \\ \hline \end{array}$$

$$24678\$40 \left\{ \begin{array}{l} 98703360 \\ 4 \end{array} \right\} \begin{array}{r} 12 : 6 \\ \text{add } 4 \\ \hline \text{Gil. } 12 : 10 \end{array}$$

To shew with how few Figures the Answer of this Question may be attained, I shall, for the Curious, give an Example, to shew what Labour often may be spared, when one rightly understands how to contract or lessen the Numbers of the first Column against the second, or those of the second against the first, keeping still the same Proportion.

Thus

Thus,

a 102	/	112 b
b 20 2240	/	27 c
c 4 108	/	100. 5b
1	/	204. 2a
*	/	100. 25c
		25 0 Stiv.

Answ. Gil. 12 : 10

Here you see that the Figures made use of, besides the Stating of the Question, are only 14, the Answer included, in which there are 7, so that, in Reality, only 7 Figures are employed, whereas if the Figures in the first Column had been multiplied in themselves, and also those of the second, and then those Products divided into one another, as the Nature of the Question required, no less than 155 Figures, exclusive of the Answer. would have done.

34. A Merchant, in Cork, has bought for his Correspondent in Lisbon, 1 Tun of Butter, which cost with all Charges on Board, 25l. now if 100lb. of Cork are equal to 105lb. at Lisbon and the Exchange from London to Lisbon is at 6s. 3d. per Milre, and the Exchange from London to Cork at 5 per Cent. advance for Cork; I would know how many Res. that Butter will stand in at Lisbon, without Freight or other Charges there? *Answ.* 76 £ 190 $\frac{1}{11}$ Res.

This Question is solved by 8 Figures exclusive of the Answer and Stating.

CHAP.

C H A P. XXI.

The Double Rule of THREE DIRECT.

S E C T. I.

THIS Rule has its Name from having five Numbers given, to find a sixth in Proportion thereunto, of which five Numbers, there are three of Supposition, and two of Demand, and is resolved thus ;

1. If 450l. in $8\frac{1}{3}$ Months gain 25l. at how much per Ct. is that per Annum? *Answ.* 8 per Ct.

Example.

$ \begin{array}{r} \text{l.} \\ 450 \\ \text{m. } 8\frac{1}{3} \\ \hline 28 \end{array} $	$\rangle$	$ \begin{array}{r} \text{l.} \\ 25 \\ \hline 28 \end{array} $	$ \begin{array}{r} \text{l.} \\ 100 \\ 12 \text{ m.} \\ \hline 1200 \\ \cdot 3 \\ \hline 3600 \\ 450 \left\{ \begin{array}{l} 8 \text{ Answ.} \end{array} \right. \end{array} $
---	-----------	--	---

Or Thus,

m.	l.	m.
If $8\frac{1}{3}$ ———	25 ———	12 comes 36
If 450 ———	30 ———	— 100 <i>Answ.</i> 8.

2. If 240l. in 16 Months, gain 64l. how much will 60l. gain in 6 Months? *Answ.* 6l.

3. If 60l. gain in 6 Months 6l. what will 240l. gain in 16 Months? *Answ.* 64l.

P

4. A Mer-

4. A Merchant agrees with a Carrier, to carry 15 Ct. of Goods, 40 Miles, for 10 Crowns, (each Crown 65d.) how much must one pay, in Proportion to have 6 Ct. carried 32 Miles? *Answ.* 17s. 4d.

5. If 20 Ct. are to be carried 50 Miles for 5l. how much will 40 Ct. cost if they are to be carried 100 Miles? *Answ.* 20l.

6. How much will 32 $\frac{2}{3}$ l. gain in 4 Months and 15 Days, (each Month 30 Days) if 324l. gain in 14 Months 35l.? *Answ.* 1l. 2s. 6d.

7. If 32 $\frac{2}{3}$ l. get 1 $\frac{1}{8}$ l. in 4 $\frac{1}{2}$ Months how much will 324l. get in 14 Months? *Answ.* 35l.

8. If 1lb. of Thread make 3 Yards of Linen of 1 $\frac{1}{4}$ Yard broad, how many lb. of Thread would be wanted to make a Piece of Linen of 45 Yards long, and 1 Yard broad? *Answ.* 12lb.

9. If 3lb. of Worsted make 10 Yards of Stuff of 1 $\frac{1}{2}$ Yard broad, how many lb. would be wanted to make a Piece of 100 Yards long, and 1 $\frac{1}{4}$ broad? *Answ.* 25lb.

10. If $\frac{1}{2}$ a Yard of Cloth, of 1 $\frac{3}{4}$ Yard broad, is made with $\frac{1}{4}$ lb. of Yarn, how many lb. will be wanted to make a Piece of Cloth 80 Yards long, and $\frac{3}{4}$ Yard broad? *Answ.* 17 $\frac{1}{7}$ lb.

11. If 15 $\frac{1}{8}$ lb. of Worsted make 15 $\frac{3}{4}$ Yards of Cloth of 1 $\frac{1}{2}$ Yard broad, how many lb. of Worsted will be wanted to make a Piece of Cloth of 75 $\frac{1}{2}$ Yards long, and 1 $\frac{1}{4}$ Yard broad? *Answ.* 60 $\frac{6}{7}$ $\frac{3}{5}$ $\frac{5}{12}$ lb.

12. If 12 Men in 8 Days gain 8l. 8s. what will 28 Men gain in 15 Days? *Answ.* 36l. 15s.

13. What

13. What will 12 Men gain in 8 Days, if 28 Men in 15 Days gain 36l. 15s. ? *Answ.* 8 $\frac{2}{3}$ l.

14. If I had a Bond for 876l. 14s. 10d. payable in 79 Days, and agreed to receive the Money immediately, with 6 per Ct. per Annum Abatement, I demand how much I am to receive ? *Answ.* 865l. 7s. 1 $\frac{4092}{9125}$ d.

—II.—

15. If 3 Masters, who have each 8 Apprentices, in 5 Weeks, each Week 6 Days, earn 36l. how much will 5 Masters, who have each 10 Apprentices, earn in 8 Weeks, each Week 5 $\frac{1}{2}$ Days, their daily Wages being equal to the former ? *Answ.* 110l.

Example.

Masters, 3	1.	5 Masters,
Appren. 8		10 Appren.
Weeks, 5	36	8 Weeks.
Days, 6		5 $\frac{1}{2}$ Days.

720
2

1440

4400
36

138400 *Answ.* 110l.

Or Thus,

3	8	5
8	10	8
5	5 $\frac{1}{2}$	
6		

55
2

Answ. 110l.

P 2

16. If

16. If a Cistern of 16 Feet long, 7 Feet broad, and 15 Feet deep, cost 9l. 6s. 8d. I demand how much, in Proportion, another Cistern would stand in, of $17\frac{1}{2}$ Feet long, $10\frac{1}{2}$ Feet broad, and 13 Feet deep? *Answ.* 13l. 5s. 5d.

17. How many Stones of $\frac{3}{4}$ Foot long, $\frac{2}{7}$ Foot broad, and $\frac{4}{5}$ Foot thick, would build a Wall of 160 Feet long, 30 Feet high, and 2 Feet thick? *Answ.* 24000.

18. If a Cistern of $17\frac{1}{2}$ Feet long, $10\frac{1}{2}$ Feet broad, and 13 Feet deep, holds 546 Barrels of Water, how many Barrels will a Cistern hold of 16 Feet long, 7 Feet broad, and 15 Feet deep? *Answ.* 384 Barrels.

19. If 6 Shoemakers, in 4 Weeks, make 36 Pair of Men's, and 24 Pair of Women's Shoes, how many Pair of each Sort, would 18 Shoe-makers make in 5 Weeks? *Answ.* 135 Pair of Men's and 90 Pair of Women's Shoes.

C H A P. XXII.

OF INVERSE PROPORTION, OR, THE RULE OF THREE INVERSE.

S E C T. I.

*W*HEREAS, in the Rule of Three Direct, more required more, or less required less, so here the contrary, more requires less, and less requires more, That is, the greater the third Number is, the less the fourth will be, and the less the third Number is, the greater the fourth will be.

RULE.

RULE. Let your first and last Number be of one Name, then multiply your first and second Numbers together, and the Product divide by the third Number, and the Quotient is the Answer required.

1. A Captain of a Ship, being provided with Provisions for 40 Men 10 Months, how long would those Provisions last for 32 Men? *Answ.* $12\frac{1}{2}$ Months.

Example.

Men	Months	Men
40	10	32
10		
—		
400	{	$12\frac{1}{2}$
322	{	
3	{	

2. If $12\frac{1}{2}$ Months Provision serve 32 Men, how long would the same serve 40 Men? *Answ.* 10 Months.

3. A Merchant has agreed with a Carrier to carry 12Ct. of Merchandizes 70 Miles, for 13 Crowns, but the Cars being laden, the Carrier is obliged to unlade 2Ct. of the Goods, however, the Merchant will still give the 13 Crowns, provided he carries the Goods so much farther in Proportion: I demand how many Miles they must be carried? *Answ.* 84 Miles.

4. If 10Ct. are to be carried 84 Miles for 13 Crowns, how many Miles are 12Ct. to be carried for the same Money? *Answ.* 70 Miles.

5. If I had bought 30 Yards of Cloth, of 2 Yards broad, and would have Baize of 3 Yards broad to line the same with: I demand how many Yards I should want? *Answ.* 20 Yards.

6. If I lend my Friend 4^l. for 7 Months, how much Money ought he to lend me again for 12 Months? *Answ.* 233^l. 6s. 8d.

7. Suppose 4000 Soldiers, in a Town, were provided with Provisions for 3 Months, how many Men must they send out in Case they would have the Provisions last 8 Months? *Answ.* 2500 Men.

8. When the Bushel of Wheat costs 5s. 8d. the Penny Loaf weighs $11\frac{1}{2}$ oz. what must it weigh when the Bushel costs 10s. 9d.? *Answ.* $6\frac{8}{25}$ oz.

9. If 136 Masons can make a Fort in 28 Days, and that it was required to have the same finished in 8 Days, I demand how many Masons would do it? *Answ.* 476 Masons.

10. How many Yards of Linen of $\frac{5}{6}$ Yard broad, would be wanted to line $9\frac{3}{4}$ Yards of Cloth of $1\frac{1}{4}$ Yard broad? *Answ.* $14\frac{1}{2}$ Yards.

11. If a Horseman rides 100 Miles in 33 Hours 20 Minutes, that is, at the Rate of 3 Miles an Hour, in what Time would he ride the same distance, if he went at the Rate of $5\frac{1}{4}$ Miles an Hour? *Answ.* 19 Hours, $2\frac{6}{7}$ Minutes.

12. If with 100^l. in 365 Days I gain 6^l. with how many Pounds sterling, could I gain the same Sum in 30 Days? *Answ.* With 1216^l. 13s. 4d.

13. If

13. If 6 Persons in 4 Hours drink 3 Gallons of Beer, in what Time would 5 Persons drink the same Quantity if they drink at the same Rate? *Ans.* In 4 Hours 48 Minutes.

14. What Sum ought to be put at Interest, at 6 per Ct. to gain in one Month as much as 100l. would gain in 12 Months? *Ans.* 1200l.

C H A P. XXIII.

The Double Rule of Three Compound.

S E C T. I.

THIS Rule, like the Double Rule of Three Direct, contains also two Rules of Three, but the one is Direct, and the other Inverse.

1. If 100l. in 12 Months gain 5l. with how many Pounds can I gain in 16 Months, 30l.? *Ans.* 450l.

Example.

	16	Stock	12	
M.	12		16	Inverse.
Gain	5	100	30	Direct.
	80		360	
			100	
			36000	
			8888	
			}	450l.

Or

176 *The Double Rule of Three Compound.*

Or thus, by Direct Rules.

M.	Gain	M.
If 12 ———	5 ———	16 comes $6\frac{2}{3}$
Gain	Stock	Gain
If $6\frac{2}{3}$ ———	100 ———	30 <i>Anfw.</i> 450l.

Or thus,

	M.	l.	M.
Inverse	12 ———	100 ———	16 comes 75l.
Direct	5 ———	75 ———	30 <i>Anfw.</i> 450l.

2. With how many Pounds Sterling, could I gain 5l. per Annum, if with 450l. I gain in 16 Months 30l. ? *Anfw.* With 100l.

3. If 8l. are gained in 12 Months with 100l. with how much Money can I gain 8l. 12s. in 5 Months ? *Anfw.* With 258l.

4. If 200lb. of Merchandizes are carried 40 Miles, for 3s. how many lb. might be carried 60 Miles, for 22l. 14s. 6d. ? *Anfw.* 20200lb.

5. If a Wall of 28 Feet high is built in 15 Days by 68 Men, how many Men could build a Wall of 32 Feet high in 8 Days ? *Anfw.* $145\frac{5}{7}$ Men.

6. If for 3s. 200lb. of Merchandizes are carried 40 Miles, how many Miles might 20200lb. be carried for 22l. 14s. 6d. ? *Anfw.* 60 Miles.

7. If 145 Men in 8 Days, can make a Wall of 32 Feet high, how many Men could make another Wall of 28 Feet high in 15 Days ? *Anfw.* $67\frac{2}{3}$ Men.

8. If 80000 Ct. of Ammunition were to be removed from a Place in 9 Days, and that in 6 Days Time I find to have carried away 4500 Ct. with 18 Horses,

Horses, how many Horses would be wanted to carry the remainder away in 3 Days? *Answ.* 604 Horses.

9, In what Time could I, with 600*l.* gain 33*l.* 6*s.* 8*d.* at $6\frac{1}{4}$ per Cent. per Annum? *Answ.* In 10 Months, 20 Days, or in $10\frac{2}{3}$ Months.

10. If 33*l.* are gained with 600*l.* in $10\frac{2}{3}$ Months, in what Time could I get 6*l.* with 100*l.*? *Answ.* In 1 Year.

C H A P. XXIV.

O F I N T E R E S T.

S E C T. I.

1. **H**OW much is the Interest of 100*l.* for $4\frac{1}{2}$ Years, at the Rate of 8 per Ct.? *Answ.* 36*l.*

Example.

Year. *l.* Year.

1 — 8 — $4\frac{1}{2}$

2 2

—

9

8

—

$\begin{matrix} 72 \\ 22 \end{matrix} \left\{ \begin{matrix} 36 \\ 6 \end{matrix} \right.$

Or thus,

8

$4\frac{1}{2}$

—

4 Years 32

$\frac{1}{2}$ Year 4

—

Answ. 36*l.*

2. What is the Interest of 100*l.* for 5 Years and 3 Months, at the Rate of 8 per Cent.? *Answ.* 42*l.*

3. How much is the Interest of 100*l.* for 1 Year and 9 months, at 6 per Cent.? *Answ.* 10*l.* 10*s.*

4. What

4. What is the Interest of 100l. for $7\frac{1}{2}$ Months, at 7 per Cent. ? *Ans*w. 4l. 7s. 6d.

5. Cast up the Interest of 100l. for 10 Years, and 4 Months, at 6 per Cent. ? *Ans*w. 62l.

6. Tell me the Interest of 100l. for $1\frac{1}{2}$ Month, at 8 per Ct. ? *Ans*w. 1l.

—II.—

7. What is the Interest of 211l. 5s. for one Year at 6 per Ct. ? *Ans*w. 12l. 13s. 6d.

Example.

$$\begin{array}{r}
 \text{l.} \quad \text{s.} \\
 211 : 5 \\
 \quad \quad 6 \\
 \hline
 \text{£. } 12 \overline{) 67} : 10 \\
 \quad \quad 20 \\
 \hline
 \text{s. } 13 \overline{) 50} \\
 \quad \quad 12 \\
 \hline
 \text{d. } 6 \overline{) 00}
 \end{array}$$

8. How much is the Interest of 300l. 10s. for 1 Year, at the Rate of 8 per Cent. ? *Ans*w. 24l. os. $9\frac{3}{4}$ d.

9. What will the above Sum come to, for 9 Months ? *Ans*w. 18l. os. $7\frac{1}{5}$ d.

10. Cast up the Interest of 580l. 15s. for 1 Year, at 6 per Cent. ? *Ans*w. 34l. 16s. $10\frac{4}{5}$ d.

11. Tell me the Interest of 344l. 17s. 6d. for 1 Year, at the Rate of 6 per Cent. ? *Ans*w. 20l. 13s. $10\frac{1}{5}$ d.

—III.

—III.—

12. What is the Interest of 340l. for $1\frac{1}{2}$ Year, at 8 per Cent.? *Answ.* 40l. 16s.

Example.

	<i>l.</i>	<i>s.</i>	<i>d.</i>
<i>l.</i> 340	for 1 Year	27	4 : 0
8	$\frac{1}{2}$ Year	13	12 : 0
	<i>Answ.</i>	40	16 : 0
£. 27 20			
20			
s. 4 00			

13. Cast up the Interest of 1000l. for 15 Months, at 8 per Cent.? *Answ.* 100l.

14. What will the above Sum come to, for 21 Months? *Anw.* 140l.

15. Tell me the Interest of 1090l. for 17 Months, at 8 per Cent.? *Answ.* 123l. 10s. 8d.

16. How much will the Interest of the foregoing Sum come to, for 23 Months? *Answ.* 167l. 2s. 8d.

17. What is the Interest of 150l. for $3\frac{1}{2}$ Months, at 8 per Cent.? *Answ.* 3l. 10s.

18. Cast up the Interest of 514l. for 1 Year, $7\frac{1}{2}$ Months, at 8 per Cent.? *Answ.* 66l. 16s. $4\frac{2}{3}$ d.

—IV.—

19. How much is the Interest of 348l. 15s. for 18 Months, at 7 per Cent.? *Answ.* 36l. 12s. 4 $\frac{1}{2}$ d.

Example.

Example.

$$\begin{array}{r}
 \begin{array}{rcl}
 l. & s. & \\
 348 & : 15 & \\
 & 7 & \\
 \hline
 \text{£. } 24 & | 41 & : 5 \\
 & 20 & \\
 \hline
 s. & 8 & | 25 \\
 & & 12 \\
 \hline
 d. & 3 & | 00
 \end{array}
 \end{array}$$

$$\begin{array}{rcl}
 l. & s. & d. \\
 \text{for 1 Year } 24 & : 8 & : 3 \\
 \text{for } \frac{1}{2} \text{ Year } 12 & : 4 & : 1\frac{1}{2} \\
 \hline
 36 & : 12 & : 4\frac{1}{2}
 \end{array}$$

20. At 8 per Ct. what will 468l. 16s. 8d. come to, for 1 Month? *Answ.* 3l. 2s. 6 $\frac{2}{3}$ d.

21. At 7 per Cent. tell me what will 3800l. 14s. 4d. come to, for 1 $\frac{1}{3}$ Year? *Answ.* 354l. 14s. 8 $\frac{4}{5}$ d.

22. What will 3020l. come to, for 5 $\frac{1}{2}$ Months, at 8 per Cent.? *Answ.* 110l. 14s. 8d.

23. How much is the Interest of 175l. 10s. 6d. for 1 Year, 7 Months. at 6 per Cent.? *Answ.* 16l. 13s. 5 $\frac{9}{10}$ d.

24. Cast up the Interest of 886l. 16s. for 1 Year, 11 $\frac{1}{2}$ Months, at 8 per Cent.? *Answ.* 138l. 18s. 7 $\frac{1}{2}$ d.

—V.—

25. How much is the Interest of 100l. from the 7th of May. to the 26th of September, at 8 per Cent.? *Answ.* 3l. 2s. 2 $\frac{7}{13}$ d.

Example.

Example.

May 24 Days.

June 30

July 31

Aug. 31

Sept. 26

d. l. —

If 365—8—142 ? *Answ.* 3l. 2s. $2\frac{7}{3}$ d.

26. What is the Interest of 100l. from the 4th of March to the 29th of September, at 7 per Ct. ?

Answ. 4l. 0s. $1\frac{7}{11}$ d.

27. At 6 per Cent. what will the Interest of 100l. be from the 5th of July to the 9th of January ?

Answ. 3l. 1s. $9\frac{1}{3}$ d.

28. Cast up the Interest of 100l. at 8 per Cent. from the 6th of June to the 28th of December ?

Answ. 4l. 9s. $10\frac{2}{3}$ d.

29. Tell me the Interest of 100l. from the 10th of May to the 30th of August, at 8 per Cent. ?

Answ. 2l. 9s. $1\frac{1}{7}$ d.

30. How much is the Interest of 100l. from the 3d of April to the 25th of February, at 7 per Cent. ?

Answ. 6l. 5s. $9\frac{1}{3}$ d.

—VI.—

31. How much is the Interest of 175l. for 1 Year and 73 Days, at 8 per Cent. ? *Answ.* 16l. 16s.

Example.

l. l. l. l. s.

100—8—175 comes 14 : 0

ds. l. ds.

365—14—73 comes 2 : 16

Answ. £. 16 : 16

Q

Or

Or thus,

l. 100 ds. 365	$\rangle$	l. 8	$\langle$	l. 175 ds. 438	<i>Answ.</i> 16l. 16s.
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32. Cast up the Interest of 240l. for 1 Year, and 135 Days, at 7 per Cent? *Answ.* 23l. 0s. $3\frac{2}{3}$ d.

33. What is the Interest of 371l. for 1 Year and 213 Days, at 6 per Cent. ? *Answ.* 35l. 5s. $0\frac{36}{1825}$ d.

34. Tell me the Interest of 564l. for 1 Year, 335 Days, at 8 per Cent. ? *Answ.* 86l. 10s. $7\frac{4}{3}$ d.

35. How much is the Interest of 150l. 15s. 6d. for 53 Days, at 7 per Cent. ? *Answ.* 1l. 10s. $7\frac{1+753}{18250}$ d.

—VII.—

36. A Merchant borrows at Interest 250l. at 8 per Cent. for 2 Years, with Condition to pay before the Time as much of the Principal as he pleases, now at the expiration of 9 Months, he pays 80l. and 6 Months after 70l. leaving the Rest the full Time, of the aforesaid 2 Years; I would know how much Principal and Interest, the Merchant is then to pay ? *Answ.* 127l. 16s. 0d.

Example,

Example.

$\begin{array}{r} \text{l.} \\ 100 \\ 12 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$ 1200	$\begin{array}{r} \text{l.} \\ 250 \\ 9 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$ 2250	Interest 9 comes 15l. os. od. 250 80
	$\begin{array}{r} 100 \\ 12 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$ 170 70	$\begin{array}{r} 170 \\ 6 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$ 170 70
		comes 6 : 16 : 0 21 : 16 : 0
$\begin{array}{r} \text{l.} \\ 100 \\ 12 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$	$\begin{array}{r} \text{l.} \\ 100 \\ 9 \end{array} \begin{array}{c} \nearrow \\ \searrow \end{array} \begin{array}{c} \text{l.} \\ 8 \end{array}$	Interest Principal 9 comes 6 : 00 : 00 27 : 16 : 00 100 : 00 : 00

Answ. £. 127 : 16 : 00

37. Suppose I borrow at Interest 300l. at 6 per Cent. for 18 Months, with Condition to pay as much of the Principal, before the Time, as I please; now after 3 Months Time I pay 60l. and 4 Months after that 100l. and 5 Months after that I pay 75l. I would know how much I have yet to pay for Principal and Interest at the Expiration of the 18 Months? *Answ.* 79l. 15s. od.

38. Lent at Interest 600l. the 13th of May 1717, for 1 Year, at the Rate of 5 per Cent. with Condition that the Receiver may discharge as much of the Principal before the Time as he pleases; now he pays the 9th of July 200l. and the 17th of September 150l. I would know how much Prin-

cipal and Interest he is more to pay at the Expiration of the Year, counting it 365 Days? *Answ.* 266l. 13s. 5 $\frac{7}{3}$ d.

39. A gives to B. at Interest, Anno 1717, primo Novembris, 6000l. at 4 $\frac{1}{2}$ per Cent. B to repay him, with interest, at the Expiration of 2 Years; having Liberty to pay before that Time as much of the Principal as he pleases; now B pays,

The 16th of December, 1717, - £. 900

The 11th of March, - - - - - 1260

The 30th of Ditto, - - - - - 600

The 17th of August, - - - - - 300

The 12th of February, 1719, - - - 1048

I would know how much Principal and Interest B, primo Nov. Anno 1719, is to pay? *Answ.* 1642l. 9s. 2 $\frac{1}{8}$ $\frac{4}{25}$ d.

C H A P. XXV.

Of INTEREST upon INTEREST.

S E C T. I.

WHAT will 500l. amount to for 3 Years, at 8 per Cent. Interest upon Interest? *Answ.* 629l. 17s. 1 $\frac{1}{2}$ $\frac{1}{5}$ d.

Example.

l. l. l. l. s.

If 100—108—500 comes 540 : 0 the 1st. Year.

100—108—540 comes 583 : 4 the 2nd Year.

100—108—583 : 4 *Answ.* 629 : 17 : 1 $\frac{1}{2}$ $\frac{1}{5}$ the 3d Year.

Or

Or thus.

Prin. Int. Prin. Interest.
If 100—8—500 comes 40 : 0 the 1st Year,
40

100—8—540 comes 43 : 4 the 2nd Year,
43 : 4

100—8—583 : 4 comes 46 : 13 : $1\frac{1}{2}\frac{1}{5}$ the 3rd Year
Principal 500 : 00 : 0

Ans. 629 : 17 : $1\frac{1}{2}\frac{1}{5}$

Or thus.

l. l. l.
100—108—500
20

10000

12

120000

108

960000

1200000

the 1st Year 129600(00
108
3718 (1 { 1259(7
81168 {
12 { 1036800

Ans. 629 : 17 : $1\frac{1}{2}\frac{1}{5}$ 1296000

2nd Year 139968(00
108

1119744

1399680

3rd Year 151165(44

Q 3

SCHO.

Principal and Interest he is more to pay at the Expiration of the Year, counting it 365 Days? *Answ.* 266l. 13s. $5\frac{7}{3}$ d.

39. A gives to B. at Interest, Anno 1717, primo Novembris, 6000l. at $4\frac{1}{2}$ per Cent. B to repay him, with interest, at the Expiration of 2 Years; having Liberty to pay before that Time as much of the Principal as he pleases; now B pays,

The 16th of December, 1717, - - - £. 900

The 11th of March, - - - - - 1260

The 30th of Ditto, - - - - - 600

The 17th of August, - - - - - 800

The 12th of February, 1719, - - - 1048

I would know how much Principal and Interest B, primo Nov. Anno 1719, is to pay? *Answ.* 1642l. 9s. $2\frac{1}{8}\frac{4}{2}\frac{6}{5}$ d.

C H A P. XXV.

OF INTEREST upon INTEREST.

S E C T. I.

WHAT will 500l. amount to for 3 Years, at 8 per Cent. Interest upon Interest? *Answ.* 629l. 17s. $1\frac{1}{2}\frac{1}{3}$ d.

Example.

l. l. l. l. s.

If 100—108—500 comes 540 : 0 the 1st. Year.

100—108—540 comes 583 : 4 the 2nd Year.

100—108—583 : 4 *Answ.* 629 : 17 : $1\frac{1}{2}\frac{1}{3}$ the 3d Year.

Or

Or thus.

Prin. Int. Prin. Interest.

If 100—8—500 comes 40 : 0 the 1st Year,
40

100—8—540 comes 43 : 4 the 2nd Year,
43 : 4

100—8—583 : 4 comes 46 : 13 : $1\frac{1}{2}\frac{2}{5}$ the 3rd Year
Principal 500 : 00 : 0

Ans. 629 : 17 : $1\frac{1}{2}\frac{2}{5}$

Or thus.

l. l. l.
100—108—500
20

10000

12

120000

108

960000

1200000

the 1st Year 129600(00
108
3718 (1 { 1259(7
131168
12 1036800

Ans. 629 : 17 : $1\frac{1}{2}\frac{2}{5}$ 1296000

2nd Year 139968(00
108

1119744

1399680

3rd Year 151165(44

Q 3

SCHO.

SCHOLIUM.

✍ Although it be according to the Laws and Custom of *Ireland*, to compute interest at the Proportion of 6 per Cent. yet he that takes Money at Interest for any Time less than even or complete Years, pays more Interest than seems reasonably due, according to the Rules of Art; as for Instance, if 100l. be forborn at Interest one whole Year, it amounts to 106l. but (I say) if it be repaid at the half Year's End, it should not amount to 103l. as appears from this following Proportion.

Let a = the Amount due at the half Year's End, then it will be $100 : a :: a : 106$ the Amount at the Year's End. Ergo, $aa = 10600$, and $a = \sqrt{10600} = 102.9563 = 102\text{l. } 19\text{s. } 1\frac{1}{2}\text{d.}$ which is less than 103l. by $10\frac{1}{2}\text{d.}$ and if it be paid in less than $\frac{1}{2}$ a Year's Time, the Error must needs be the greater.

Mr. *Ward* places this Scholium at the End of his Chapter of Simple Interest, but it seems more properly to belong to Compound Interest: for, if 100l. be forborn at Interest one whole Year, it amounts to 106l. but if it be repaid at the half Year's End, it amounts according to the Rules of Simple Interest laid down by *Ward*, to 103l. exactly; but according to the Rules of Compound Interest, laid down by the same Author, it amounts to 102l. 19s. $1\frac{1}{2}\text{d.}$ only as Mr. *Ward* remarks.

The celebrated Mathematician, *Philip Ronayne*, Esq; observes, that altho' it be not lawful to let out Money at Compound Interest; yet, in purchasing of Annuities or Pensions, &c. and taking Leases in Reversion, it is very usual to allow Compound Interest to the Purchaser for his Ready Money; and therefore it is very requisite to understand it.

CHAP.

C H A P. XXVI.
Of B A R T E R.
S E C T. I.

1. **A** Merchant barter 10 Pieces of Drugget, containing each 25 Yards, at $18\frac{1}{2}$ d. the Yard, against Pepper of 15d. the lb. how much Pepper must he receive? *Anfw.* $308\frac{1}{3}$ lb.

Example.

10 Ps.	
25	
250	
18 $\frac{1}{2}$	
2000	
250	
125	
4625	

(5	}	308 $\frac{1}{3}$ lb.
125		
4625		
1555		
11		

2. A Merchant has 1000lb. of Sugar, which he barter at $9\frac{1}{2}$ d. the lb. against Tobacco at $10\frac{1}{4}$ d. the lb. how much Tobacco must he receive? *Anfw.* $926\frac{3}{4}$ lb.

3. A gives to B 250 Yards of Drugget, at $18\frac{1}{2}$ d. the Yard, for $308\frac{1}{3}$ lb. of Pepper, I demand at how much the Pepper stands him in the lb.? *Anfw.* 15d.

4. A has 1200 Stone of Tallow, at 2s. $3\frac{1}{4}$ d. the Stone, B has 110 tann'd Hides, wt. 3994lb. at $5\frac{3}{4}$ d. the lb. and they Barter at these Rates, tell me how much Money A is to receive of B, besides the Hides? *Anfw.* 40l. 11s. $2\frac{1}{2}$ d.

5. A trucks

5. A trucks Drugget of $18\frac{1}{2}$ d. the Yard, against $308\frac{1}{3}$ lb of Pepper at 15d. the lb. how many Pieces of Drugget (every Piece 25 Yards) has he delivered? *Anfw.* 10 Pieces.

—II.—

6. A has Silk of 14s. per lb. B has Cloth of 10s. per Yard, which he barterers at 12s. 6d. the Yard, at how much must A charge his Silk, to make his Profit equal with B? *Anfw.* 17s. 6d.

Example.

s. s. d. s
If 10—12 : 6—14 *Anfw.* 17s. 6d.

Or thus,

s. d.
12 : 6
10 : 0

s. ————— s. s. d
If 10 ————— 2 : 6—14 comes 3 : 6
14 : 0

Anfw. 17 : 6

7. A has Coffee which he barterers with B at 10d. per lb. more than it cost him, against Tea which stands B in 10s. the lb. but charges it at $12\frac{1}{2}$ s. I would know how much the Coffee cost at first? *Anfw.* 3s. 4d.

8. A has 150 Barrels of Barley. which cost him 5s. per Barrel, which he barterers at 5s. 10d. with B, who has Wheat that cost him 12s. the Barrel, at how much must B charge his Wheat to gain in Proportion as much as A, and how many Barrels is he to deliver? *Anfw.* $62\frac{1}{2}$ Barrels at 14s.

9. Two

9. Two Persons barter, the one has Butter, which cost him 28s. per Ct. the other has Beef which cost 22s. 6d. per Barrel; now, they have both a Mind to gain 8 per Ct. tell me at how much they must charge their Goods? *Answ.* At 30s. $2\frac{2}{5}$ d. per Ct. and at 24s. $3\frac{3}{5}$ d. per Barrel.

10. A and B barter some Goods, A charges his at $30\frac{6}{5}$ s. and then he gains 8 per Cent. B gains the same, for he charges his at $24\frac{3}{10}$ s. let me know how much these Goods cost at first? *Answ.* 28s. and 22s. 6d.

—III.—

11. B has 5 Tuns of Butter at 25l. 10s. per Tun, and $10\frac{1}{2}$ Tuns of Tallow at 33l. 15s. per Tun, which he barter with C, thus, to have 150l. 1s. 6d. in Money, and the rest in Beef at 21s. per Barrel, how many Barrels is he to receive? *Answ.* 316 Barrels.

Example.

	l.	s.	d.
5 Tuns at $25\frac{1}{2}$ l. is	127	10	0
$10\frac{1}{2}$ Tuns at $33\frac{3}{4}$ l. is	354	7	6
	l.	481	17 : 6
In Cash, 150	:	1	: 6
s.	Bar.		
If 21	—	1	— 331 : 16 : 0 <i>Answ.</i> 316

12. A has 5 Bales of Pepper, wt. neat 1600lb. at 17d. per lb. which he barter with B for two Sorts of Goods, the one at 5d. the other at 8d. per lb. to have $\frac{1}{3}$ in Money, and of each Sort of Goods an equal Quantity. I demand how many lb.

lb. of each Sort of Goods, and how much Money he is to receive? *Answ.* $1394\frac{3}{5}$ lb. of each, and 37l. 15s. $6\frac{2}{3}$ d. in Money.

13. Two Merchants barter, C has 10 Hhds. of Madder, qt. neat, 90 Ct. 3qrs. 14lb. cost 38s. 6d. per Ct. and charges it at 42s. per Ct. D has Hemp which cost 34s. 10d. per Ct. C desires $\frac{1}{4}$ in Money, the Rest in Hemp; tell me how much Money and Hemp C has to receive, also at how much D must charge the Price of the Hemp, to make the Barter equal? *Answ.* C must receive 47l. 14s. $2\frac{1}{4}$ d. and 75Ct. 1qr. $9\frac{1}{8}$ lb. of Hemp, at the Rate of 38s. per Ct.

14. C Barter 10 Hhds of Madder, qt. 90 Ct. 3qrs. 14lb. which he charges at 42s. per Ct. for which D is to give him $\frac{1}{4}$ Part in Money and the Rest in Hemp, which cost him 34s. 10d. per Ct. but charges it at 38s. what is the first Cost of the Madder, allowing C raised his Price in Proportion to D, and how much Money and Hemp is C to receive? *Answ.* The Madder cost 38s. 6d. per Ct. and C is to receive 47l. 14s. $2\frac{1}{4}$ d. in Money, and 75Ct. 1qr. $9\frac{1}{8}$ lb in Hemp.

—IV.—

15. I have Merchandizes which cost me 30s. per Ct. but charge them at 34s. he has Merchandizes which cost him 25s. per Ct. and charges them at 28s. per Ct. and so we barter our goods; now I want to know who has made the best Bargain, and by how much per Ct.? *Answ.* I gain $1\frac{1}{3}$ per Ct. more than he.

Example.

Example.

s. s. s.
 If 30 — 4 — 100 *Answ.* $13\frac{1}{3}$
 If 25 — 3 — 100 *Answ.* 12

Differs $1\frac{1}{3}$

16. A and B barter, A has Cloth which cost 28d. the Yard, but charges it at 32d. B. has Cloth cost 22d. the Yard; tell me how high B must charge his Cloth to gain 5 per Cent more than A? *Answ.* $26\frac{1}{7}\frac{7}{8}$ d. per Yard.

17. A and B barter, A has Cloth which cost him 28d. the Yard, B's cost 22d. and charges it at 25d. tell me how high A must charge his to gain 10 per Ct. more than B? *Answ.* $34\frac{3}{5}\frac{4}{5}$ d.

18. C and D barter, C makes 7s. 6s. 8d. D makes 7s. 6d. 7s. 3d. I demand who has lost most, and how much per Ct? *Answ.* C loses $1\frac{2}{7}$ per Ct. more than D.

19. A charges his Merchandizes from 3l. 10s to 4l. 6s. B charges his from 1l. 16s. to 2l. 4s. and so they barter. A has a Mind to gain yet 10s. more. I demand how high B must put his Price to make the Barter equal? *Answ.* 2l. $9\frac{1}{3}\frac{1}{3}$ s.

20. A and B barter, A has Muslin which cost him 30s. per Piece, but has a Mind to gain 10 per Ct. B has Silk, which cost 42s. per Piece; tell me at how much B must charge his Silk to make the Barter equal? *Answ.* $46\frac{1}{5}$ s.

21. A has Sugar which cost him 59s. 6d. per Ct. and has a Mind to gain 15 per Ct. B has Oil which cost 6s 3d. per Gallon; at how much must B charge his Oil to gain as much per Ct. as A? *Answ.* 7s. $2\frac{1}{4}$ d.

—V.—

22. I have Cloth of 8d. the Yard, and in Barter charge it at 13d. and give 9 Months Time for the Payment, he has goods which cost 12d. per lb. and gives 6 Months Time for the Payment; tell me how high he must charge his Goods to make an equal Barter? *Answ.* At 17d.

NOTE, Lessen one Man's Profit according to the other Man's Time.

Example.

$$\begin{array}{rclcl}
 & & 13d. & & \\
 & & 8 & & \\
 \hline
 m. & & & m. & \\
 \text{If } 9 \text{ —} & & 5 \text{ —} & 6 \text{ comes } 3\frac{1}{3} & \\
 & & & 8 & \\
 & & & \hline
 d. & d. & d. & & 11\frac{1}{3} \\
 \text{If } 8 \text{ —} & 11\frac{1}{3} \text{ —} & 12 & \text{Answ. } 17d. &
 \end{array}$$

23. I and he barter our goods, mine cost 8d. per lb. but charge it at 13d. and give 9 Months Time, he charges his at 17d. and gives 6 Months Time; tell me how much his Goods cost? *Answ.* 12d.

24. Two Persons barter, A has Sugar at 8d. per lb. but charges 13d. and gives 9 Months, B has Cocoa at 12d. per lb. charges it at 17d. per lb. I demand how much Time B must give to make the Barter equal? *Answ.* 6 Months.

25. A and B barter, A has Goods which cost 15s. which he charges at 20s giving 6 Months Time, B has Goods which cost 1l. 10s. and charges them at 2l. 5s. I demand what Time he must give to make an equal Barter? *Answ.* 9 Months.

CHAP.

C H A P. XXVII.

FELLOWSHIP, OR COMPANY.

S E C T. I.

THIS Rule teaches, when two, three, or more Merchants put together a general Stock in Trade, or are concerned in Ships, &c. to know how to find every Person's particular Share of the Loss or Gain, in Proportion to his principal in the joint Stock.

Bankrupts Estates, Legacies in Case of Deficiency of Effects and many other Things of the like Nature, may also be adjusted by this Rule, as the following Examples will sufficiently shew.

1. A and B buy certain Merchandizes amounting to 80l. of which A pays 30l. and B 50l. and they gain by those Goods 20l. now I would know each Man's Share in the profit, according to their Stock put in? *Ans.* A 7l. 10s, and B 12l. 10s.

Rule. Add each Man's Stock together, then as the whole Stock is to the whole Gain, so is each Man's particular Stock to each Man's particular Gain.

Example.

A	30
B	50

If 80 ————— 20

l. s.

$\swarrow \quad \searrow$

Anfw. 7 : 10
Anfw. 12 : 10

20 : 00

R

2. A

2. A and B have gained by Merchandize, 182*l*. A put in 300*l*. and B 400*l*. I demand each of their Shares of the Profit? *Ans^w*. A 78*l*. and B 104*l*.

3. Two Persons are to share 100*l*. of which, A is to have $\frac{2}{3}$, and B the $\frac{1}{3}$ Part. I demand what each justly ought to have? *Ans^w*. A 66 $\frac{2}{3}$ *l*. and B 33 $\frac{1}{3}$ *l*.

4. A merchant being deceased, 'tis found he owes to A 500*l*. and to B 900*l*. though he left but 1100*l*. behind him. I demand how much each is to have in Proportion to his debt? *Ans^w*. A 392 $\frac{2}{7}$ *l*. and B. 707 $\frac{1}{7}$ *l*.

5. B and C are left a Legacy of 120*l*. of which B is to have $\frac{2}{3}$, and C the $\frac{1}{3}$, now tell me how much each is to have according to his Share in the 120*l*. *Ans^w*. B 80*l*. and C. 40*l*.

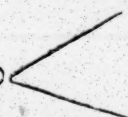
6. Three Merchants load a ship with Corn, A put in 200 Barrels, B 300, and C 400 Barrels; at Sea, the Master is obliged by Storm, to heave 180 Barrels over board, tell me how much each Merchant ought to lose for his Share? *Ans^w*. A 40, B. 60, and C 80 Barrels.

7. Two Cities, Cork and Dublin, Distance, suppose 100 Miles, A sets out from Dublin towards Cork, B sets out from Cork towards Dublin, A goes 12 Miles a Day, and B 8 Miles a Day. I demand how many Miles each has travelled when they meet? *Ans^w*. A 60, and B 40 Miles.

8. Two Merchants have gained 450*l*. of which A is to have 3 Times as much as B, tell me how much each is have? *Ans^w*. A 337*l*. 10*s*. and B. 112*l*. 10*s*.

Example.

A 3
B 1

—————
If 4—450  3 comes 337 : 10
1 comes 112 : 10

9. Three Persons have to share 600l. A is to have a certain Sum, B as much again as A, and C three times as much as B. I demand each Man's Part? *Ans.* A $66\frac{2}{3}$, B $133\frac{1}{3}$ and C 400l.

10. Three Persons are to pay a Tax of 100l. according to their Estates; now A is found to be worth 800l. B 600l. and C 400 how much is each of them to pay? *Ans.* A. $44\frac{1}{2}$ l. B $33\frac{1}{2}$ l. and C $22\frac{1}{2}$ l.

11. Three Persons have gained 1320l. now when A takes 6l. B takes 4l. and C 2l. I demand how much each gets? *Ans.* A 660l. B 440l. C 220l.

12. A and B have gained 600l. whereof A takes 10 per Cent more than B. I demand how much each receives? *Ans.* A $314\frac{2}{7}$ l. and B $285\frac{5}{7}$ l.

13. Three Persons are to divide a Legacy of 600l. A to have $\frac{6}{13}$, B $\frac{4}{13}$, and C $\frac{3}{13}$. I demand each of their Shares? *Ans.* A $276\frac{1}{3}$ l. B $184\frac{2}{3}$ l. and C $138\frac{6}{13}$ l.

14. Three Merchants formed a Company, A put in 150l. and B 260l. and they gainnd 62l. whereof C's Share came to 16l. I would know A and B's Part of the Gain, and how much C put in? *Ans.* C put in 142l. 12s. $2\frac{2}{3}$ d. A's profit 16l. 16s. $7\frac{1}{4}$ d. B's Profit 29l. 3s. $4\frac{1}{4}$ d.

R 2

15. Three

15, Three Persons join, A and B put in a certain Stock, and C puts in 1090l. they gain 110l. whereof A took 35l. and B 29l. tell me how much A and B put in, and C's Share of the Gain? *Answ.* C's Share of the Profit was 46l. A put in 829l. 6s. 11 $\frac{1}{3}$ d. B put in 687l. 3s. 5 $\frac{1}{3}$ d.

C H A P. XXVIII.

FELLOWSHIP WITH TIME

S E C T. I.

THREE Merchants formed a Company, A put in 30l. for 4 Months, B put in 20l. for 5 Months, C put in 15l. for 6 Months, and with this Stock they gain 31l. I demand each Man's Share of the Gain? *Answ.* A 12l. B 10l. and C 9l.

Rule. Multiply each Man's Stock by its Time, and the Products add together, then say, as the whole Stock and Time is to the whole Loss or Gain, so is each Man's particular Stock in Trade, to each Man's particular Loss or Gain.

Example.

A 30l	B 20l.	C 15l.
m 4	m. 5	m. 6
120	100	90
100		
90		

310 ——— 31  *Answ.*

120
100
90

12 for A
10 for B
9 for C
31
2. Two

2. Two Merchants formed a Company, A put in 100l. for 4 Months, and B put in 136l. for 3 Months, and they gain 50l. I demand each Man's Share of the Profit? *Ans.* A. 24l. 15 $\frac{5}{16}$ s. and B 25l. 4 $\frac{9}{16}$ s.

3. Three Graziers hired a piece of Land for 60l. 10s. A put in 5 Oxen for 4 $\frac{1}{2}$ Months. B put in 8 Oxen for 5 Months, and C put in 9 Oxen for 6 $\frac{1}{2}$ Months. I demand how much each must pay? *Ans.* A 11l. 5s. B 20l. and C 29l. 5s.

4. Three Persons have received 665l. Interest, A had put in 4000l. for 12 Months, B 3000l. for 15 Months, and C 5000l. for 8 Months; how much is each Man's Part of the Interest? *Ans.* A 240l. B 225l. and C 200l.

5. Three Persons hired a Piece of Land for 12l. 10s. 6d. A put in 20 Sheep for 5 Days, B put in 16 Sheep for 7 Days, and C put in 25 Sheep for 4 Days. I demand how much each must pay? *Ans.* A 4l. os. 3 $\frac{6}{13}$ d. B 4l. 9s. 11 $\frac{1}{3}$ d. and C. 4l. os. 3 $\frac{6}{13}$ d.

6. Three Merchants lost by some Dealings 45l. 10s. A's Stock was 100l. for 6 $\frac{1}{2}$ Months, B 100l. for 9 $\frac{1}{2}$ Months, and C's 150l. for 8 $\frac{2}{3}$ Months, what is each Man's part of the Loss? *Ans.* A 10l. 3 $\frac{2}{9}$ s. B 14l. 18 $\frac{3}{9}$ s. and C 20l. 7 $\frac{2}{9}$ s.

7. Three Merchants put in a Stock, viz. A puts in the 1st of January 120l. until the 23d of March, B puts in 176l. the 10th of February until the 12th of April, C puts in 295l. the 2d. of February, until the 25th of April, and they gain 800l. I want to know each Man's Part of the Gain, allowing 28 Days to the Month of February? *Ans.* A 174l. 3s. 4 $\frac{37200}{44640}$ d. B. 192l. 7s. 6 $\frac{1320}{44640}$ d. C 433l. 9s. 1 $\frac{1266}{44640}$ d.

8. Four Persons hired a Boat for 19s. to go 24 Miles, but being come within 9 Miles of the Place where they intended to go, there came 2 Persons who desired to come into the Boat, with Condition to pay proportionably; tell me how much each of them is to pay? *Anw.* The 4 first Persons 16s. and the 2 last 3s.

9. Four Persons hired a Coach to go 50 Miles for 40s. now when they were gone 20 Miles they met 2 Persons, who desired to come into the Coach, with Condition to pay proportionably; how much is each of them to pay? *Answ.* The 4 first Persons 1l. 10s. 9 $\frac{3}{4}$ d. and the 2 last 9s. 2 $\frac{1}{4}$ d.

C H A P. XXIX,

L O S S A D D G A I N.

S E C T. I.

B OUGHT a Piece of Cloth, 53 Yards long, at 12s. the Yard, sold the same at 14s. the Yard, what is the Profit on the whole Piece? *Answ.* 5l. 6s.

Example.

$$\begin{array}{r}
 \text{s. } 14 \text{ fold} \\
 \text{s. } 12 \text{ bought} \\
 \hline
 2 \\
 53 \\
 \hline
 10 \overline{) 6} \\
 \hline
 \text{£. } 5 : 6
 \end{array}$$

2. If

2. If 1lb. of Pepper cost 15d. and sold for 17d what is the Profit upon 3 Bales, weight 980lb.?
Ans. 8l. 3s. 4d.

3. Bought a Piece of Cloth 53 Yards long, for 31l. 16s. and sold it at 14s. the Yard. I demand what is gained by the whole Piece? *Ans.* 5l. 6s.

4. If 980lb. of Merchandizes are bought for 61l. 5s. and sold for 69l. 8s. 4d. I demand the Profit upon each lb.? *Ans.* 2d.

5. Bought 12 Hhds. of Wine, at 10l. 5s. the Hhd. paid for Cellarage and other Charges 4s. 6d. per Hhd. sold the Hhd. for 37 Crowns, each at 5s. 5d. I demand Profit or Loss? *Ans.* 5l. 9s. Loss.

6. A Merchant buys 100 Casks of Butter, wt. neat 210 Ct. 2qrs. 14lb. at 20s. per Ct. pays for sundry Charges 1l. 5s. I demand his Profit if he sells the Butter at 21s. 9d. per Ct. *Ans.* 17l. 3s. 7½d.

—II.—

7. If a Tun of Tallow cost 20l. and is sold for 22l. 10s. I demand how much is the Profit per Ct.? *Ans.* 12½.

Example.

$$\begin{array}{r}
 22\frac{1}{2} \\
 20 \\
 \hline
 2 \\
 20 \text{ --- } 2\frac{1}{2} \text{ --- } 100 \text{ } \textit{Ans. 12}\frac{1}{2}
 \end{array}$$

8. If I buy 1lb. of Cloves for 6s. 3d. and sell it for 6s. how much per Ct. Loss is it? *Ans.* 4 per Cent.

9. Bought

9. Bought 1000 Barrels of Wheat at 0s per Barrel, paid for divers Charges 10l. how much per Cent. is gained if the Wheat is sold at $11\frac{1}{4}$ s. per Barrel? *Ans.* $10\frac{5}{7}$ per Cent.

10. Sold certain Merchandizes for 520l. and find to have made 120l. Profit. I demand how much per Cent it is? *Ans.* 30l..

11. If 1lb. of Pepper is sold for $10\frac{1}{2}$ d. and there is lost 2d. per lb. how much is the Loss per Ct? *Ans.* 16 per Ct.

12. When I sell 1lb. of Silk for 1l. 6s. 6d. I gain 2s. 6d. now I want to know how much I should gain if I sold a Bale of Silk which cost 120l.? *Ans.* 12l. 10s.

—III.—

13. Bought 100 Oranges at the Rate of 6 for $4\frac{1}{2}$ d and sold them at the Rate of 5 for 3d. tell me how much Money is lost, and how much is the Loss per Ct.? *Ans.* Lost 15d. or 20 per Ct.

Example.

Oran.	d.	Oran.	d.
If 6	— $4\frac{1}{2}$ —	100 comes	75 bought
If 5	— 3 —	100 comes	60 sold.

d	lost	d.	15 lost
75	— 15 —	100	<i>Ans.</i> 20 per Cent

14. If 5 Lemons are bought for 4d. and 4 Lemons sold for 5d. how much is the Profit upon the Box containing 200 Lemons, and how much is it per Ct.? *Ans.* 7s. 6d. is $56\frac{1}{4}$ per Cent.

15 Suppose

15. Suppose 6 Yards of Ribbon cost 28d. and are sold at $5\frac{1}{4}$ d. the Yard, what is the Profit, at that Rate, upon a Piece of 54 Yards? *Answ.* 2s. $7\frac{1}{2}$ d.

16. Bought Coffee at the Rate of 21s. for 7lb. sold it at 3s. 4d. the lb. how much is the Profit, at that Rate, upon a Bale, wt. 346lb. and how much do I gain per Ct. *Answ.* $11\frac{1}{5}$ per Cent. or 5l. 15s. 4d. on the Bale.

—IV.—

17. A Piece of Serge 53 Yards long, cost 5l. 1s. 7d. for how much must one Yard be sold to gain by the whole Piece 1l. 2s. 1d.? *Answ.* At 28d.

Example.

l.	s.	d.
5	1	7
1	2	1

yds. ——— yd.

If 53—6 : 3 : 8—1 *Answ.* 28d.

18. If 1 Yard of Serge cost 23d. for how much must a Piece, containing 53 Yards, be sold to gain 5d. a Yard? *Answ.* For 6l. 3s. 8d.

19. How much would the former Piece of Serge come to, if it was sold at 3d. per Yard Loss? *Answ.* 4l. 8s. 4d.

20. If 112lb. of Sugar cost 2l. 15s. and are sold for $2\frac{1}{2}$ d. per lb. Profit, how much must be received for the 112lb.? *Answ.* 3l. 18s. 4d.

21. Suppose the above Sugar was sold for $\frac{3}{4}$ d. per lb. Loss, how much will then be received? *Answ.* 2l. 8s.

22. If

22. If 1lb. of Pepper cost 15d. for how much must 1lb. be sold to gain upon 30lb. as much as 5lb. cost? *Answ.* 17½d.

—V.—

23. If 1 Tun of Wine cost 40l. for how much must it be sold to gain 6¼ per Ct? *Answ.* 42l. 10s.

Example.

$$\begin{array}{r}
 100 \\
 \underline{6\frac{1}{4}} \\
 \text{If } 100 \text{ --- } 106\frac{1}{4} \text{ --- } 40 \text{ comes } 42 : 10
 \end{array}$$

Or thus,

$$\begin{array}{r}
 \text{If } 100 \text{ --- } 6\frac{1}{4} \text{ --- } 40 \text{ comes } 2 : 10 \\
 \phantom{\text{If } 100 \text{ --- } 6\frac{1}{4} \text{ --- } 40 \text{ comes }} 40 : 00
 \end{array}$$

Answ. 42 : 10

24. At what Rate must I sell 1 Ct. wt. of Mad-der, which cost 3l. 15s. to gain 10 per Cent? *Answ.* 4l. 2s. 6d.

25. At what Rate must the aforesaid Madder be sold to lose 10 per Cent? *Answ.* 3l. 7s. 6d.

26. Bought 12 Pieces of white Cloth, for 6l. 10s. per Piece, paid 20s. 10d. per Piece, for dying; for how much must I sell a Piece to gain 20 per Cent? *Answ.* 9l. 1s.

27. For how much must I sell the aforesaid Cloth a Piece, if I have a mind to gain upon the 12 Pieces 100 Crowns of 5s. 5d. each? *Answ.* 9l. 15s. 11⅓d.

28. Suppose 900lb. of any thing, cost 67l. 10s. at what Rate must it be sold per lb. to gain 2d. per lb? *Answ.* 20d.

—VI.

—VI.—

29. Bought 1 Tun of Wine, for 50l. ready Money, sold it for 54l. 10s. payable in 8 Months Time, I demand how much per Cent. I gain at that Rate per Annum? *Ans*w $13\frac{1}{2}$ per Cent.

Example.

$$\begin{array}{r}
 54\frac{1}{2} \\
 \text{£. } 50 \\
 \hline
 \end{array}
 \qquad
 \begin{array}{ccc}
 50 & & 100 \\
 \swarrow & \searrow & \swarrow \\
 8 & 4\frac{1}{2} & 12 \\
 \swarrow & \searrow & \swarrow \\
 400 & & 1200
 \end{array}
 \qquad
 \text{Ans. } 13\frac{1}{2} \text{ per Ct.}$$

30. Suppose I bought Rice for 3l. 15s. ready Money, and sold it for 4l. 6s. 3d. payable in 18 Months, how much per Cent. do I gain at that Rate per Annum? *Ans*w. 10 per Cent.

31. If 1 Tun of Tallow is bought for 23l. 6s. 8d. ready Money, and sold for 24l. 10s. payable in 9 Months, tell me how much is the Profit per Ct. in 12 Months? *Ans*w. $6\frac{2}{3}$ per Ct.

32. What is the Profit per Ct. in 12 Months upon 3000lb. of Coffee, which cost 4s. 2d. the lb. ready Money, and sold for 5s. per lb. payable in 8 Months? *Ans*w. 30 per Cent.

33. Linen Draper buys 20 Pieces of Linen, each containing 45 Yards, at 60s. per Piece for ready Money, sells them at 16d. per Yard, payable in 6 Months, how much is his profit or Loss? *Ans*w. He loses the use of his Money for 6 Months.

—VII.—

34. Bought 100 Casks of Rains at 50s. per Ct. payable in 9 Months, sold them for 52s. per Ct. payable

payable in 15 Months, what is the Profit per Ct. per Annum, at that Rate? *Ans.* 8 per Ct.

Example.

15 m.		52s.	
9 m.		50	
6 m.	s.	50	$\left. \begin{array}{c} \nearrow \\ \searrow \end{array} \right\} 2$
	m.	6	
		300	$\left. \begin{array}{c} \nearrow \\ \searrow \end{array} \right\} 12$
			1200

Ans. 8 per Ct.

35 A Vintner buys a Parcel of Brandy at 5s. 3d. per Gallon, payable in 6 Months, sells the same at 5s. 10½d. per Gallon, payable in 10 Months; how much per Cent. does he gain at that Rate per Annum? *Ans.* $35\frac{5}{7}$ per Ct.

36. If a Hundred wt of Merchandizes are bought for 56s. payable in 9 Months Time, and sold for 6¼d. the lb. payable in 12 Months Time, I demand what is gained per Ct in a Year at that Rate? *Ans.* $16\frac{2}{3}$.

37. A Tobacconist buys 10 Hhds of Tobacco, wt, near 30Ct. 3qrs. 14lb. at 9¼d. per lb. payable in 3 Months, sells it for 11d. half Farthing, payable in 7 Months, tell me how much per Cent. per Annum, he gains at that Bate? *Ans.* $60\frac{30}{7}$.

—VIII.—

38. Received from London 11300lb. of Pewter, cost 706l. 5s. English Money, the Charges here are 10l. 6s. 8d. at what Rate must I sell it per lb. to gain 15 per Cent allowing 12d. in England, to make 13d. in Ireland? *Ans.* 19d. very near, or exact $18\frac{2483}{45200}$ d.

Example.

Example.

d. d. l. s.
12.—13—706 : 5.

l. s. d.
comes 765 : 2 : 1
Charges 10 : 6 : 8

The whole Cost 775 : 8 : 9
100—15—775 : 8 : 9 come 116 : 6 : 3 $\frac{3}{4}$

£. 891 : 15 : 0 $\frac{3}{4}$

lb. l. s. d. lb.
11300—891 : 15 : 0 $\frac{3}{4}$ —1 *Ans.* 18 $\frac{4}{5}$ $\frac{2}{3}$ $\frac{8}{10}$ d.

39. A Merchant receives from Lisbon 180 Casks of Raisins, which stand him here in 16s. each, trucks them against other Merchandizes at 28s. per Ct. finds to have made 25 per Ct. Profit. I demand the weight of each Cask one with another? *Ans.* 80lb.

40. I sell Barley at 6s. per Kilderkin, and gain 20 per Ct. now if I sell a Parcel of the same Barley amounting to 3l. 15s. and find I gain 50 per Ct. tell me how many Barrels were in the last Parcel?

Ans. 10—And at what Rate I sold them?

Ans. At 7 $\frac{1}{2}$ s.

41. Received 3 Pieces of Holland, qt. No. 1, 42 Ells, at 15 $\frac{1}{4}$ Stivers the Ell, No. 2, 52 Ells, at 19 $\frac{1}{8}$ Stivers the Ell, No. 3, 64 $\frac{1}{4}$ Ells, at 20 $\frac{1}{2}$ Stivers the Ell. At how much I must sell it a Yard, one with another, to gain 20 per Ct. allowing 10 $\frac{1}{2}$ Stivers for 1s. Sterling, and 3 Yards making 4 Ells?

Ans. 2s. 10 $\frac{2}{3}$ $\frac{6}{10}$ $\frac{2}{3}$ d.

—IX.—

42. A Merchant sends to Barbadoes 300 Firkins of Butter, weight 175Ct. 2qrs. 19lb. at 18s. 8d. per Ct. pays for Duty and other Charges 11l. os

S

10d.

10d. his Correspondent at Barbadoes sells the Butter at 6d. the lb. (wt. as above) pays for Freight, &c, 24l. 17s. 1d. takes 5 per Cent. for his Commission. I demand Loss or Gain, if 135l. Barbadoes are worth but 100l. in Ireland? *Answ.* 152l. 14s. 5½d. Profit.

Example.

Ct.	qrs.	lb.		l.	s.	d.
175	: 2	: 19	at 18s. 8d per Ct.	163	: 19	: 2
Charges—				11	: 00	: 10

First Cost—175 : 00 : 00

Ct.	qrs.	lb.				
175	: 2	: 19	at 6d. the lb.	491	: 17	: 6
Charges—				24	: 17	: 1
Commission				24	: 11	: 10½

£.49 : 8 : 11½

The neat Proceeds 442 : 8 : 6½

l.	l.	l.	s.	d.	
If 135	— 100	— 442	: 8	: 6½	comes 327 : 14 : 5½
The first Cost					175 : 00 : 0

Profit 152 : 14 : 5½

43. Sent to Rotterdam 500 Salt Ox-Hides, wt. neat 400Ct. 2qrs. 14lb. cost 20s. 4d. per Ct. paid for Duty and other Charges 15l. 10s. 3d. when the Hides arrived they weighed 3937olb. and my Correspondent sells them for 15 Guilders the 100lb. deducts for Freight and other Charges 650 Guilders 17½ Stivers, and for his Commission 2 per Cent. Now tell me whether I gain or lose, if I value each Gilder at 2s. ? *Answ.* I gain 90l. 16s. 8½d.

44. A Merchant sends to Bourdeaux 200 Barrels of Beef, which cost him 20s. per Barrel, and 400 Casks of Butter, wt. neat 600Ct. 2qrs. olb.

at

at 20s. 4d per Ct. pays for Duty and other Charges 45l. 10s. 6d. the correspondent in Bourdeaux sells the Beef for 16 Livres the Barrel. and the Butter for 20 Livres the 100lb. (wt. 67850) deducts for Charges 1500 Livres, and 2 per Cent for his Commission, now if the Merchant values each Livre at 16d. I would know whether he gains or loses?

Ans. He gains 139l. 12s. 1 $\frac{3}{4}$ d.

45. A Merchant in Ireland sent to Lisbon 500 Barrels of Wheat, cost 10 $\frac{1}{2}$ s. per Barrel, 200 Firkins of Butter, wt. 110Ct. 2qrs. 14lb. at 18s. 8d. per Ct. and 400 tann'd Hides, weight 106 Ct. 3qrs. at 5 $\frac{3}{4}$ d. per lb. paid for Duty and other Charges 35l. 16s. 1d. and pays premium of Insurance of 688l. at 16 per Ct. the Wheat at Lisbon measured 5000 Alquires, and is sold at 300 Res the Alquire, the Butter wt. 387 Arobes* and 6lb. and is sold at 80 Res the lb.—The Leather wt. 373 Arobes and 20lb. and sells for 150 Res the lb. the factor pays for Duty and other Charges 832 $\frac{1}{2}$ l. 062 Res, and charges for his Commission 3 per Cent. The Factor remits the nett Proceeds to London, at 5s. 6d. per Milre, and the Merchant in Ireland, draws it from London, at 5 per Ct. advance: I demand whether he gains or loses by this Cargo? *Ans.* He gains 161l. 14s. 6d.

46. A Merchant in Ireland, sends to Ostend 20 Hhds. of Tallow, wt. 10 Tuns, 17 Ct. 3qrs. at 30l. 10s. 9d. the Tun, pays for Duty and other Charges, 25l. 10s. and for premium of Insurance 55l. 10s. the Tallow arriving at Ostend, wt. 24388lb. and the Merchant there sells it at 18 Guilders the 100lb. pays for Freight, Duty and other Charges 595 Guilders, 10 Stivers, 4 Pennings, and Charges for his Commission 2 per Ct. and remits the nett

S2

Proceeds

* Note, every Arobe is 32lb.

Proceeds to London, at 33s. 9d. Flemish, per £ Sterling, and the Irish Merchant draws it from London, at 4 per Ct. advance: I would know whether he gains or loses? *Answ.* He loses 32l. 15s. 1³⁶⁶⁴²⁹/₁₃₅₀₀₀ d.

CHAP. XXX

REBATE OR DISCOUNT.

SECT. I.

WHEN Merchants sell their Commodities upon Time, and afterwards both Parties agree that this Money shall be paid in, before it be due, allowing at the Rate of a certain interest, per Annum, this allowance is called Rebate, or Discount, and the Money so paid or received, before due, being put out to Use (at the Rate of the Discount agreed on until the Time it was due) must amount to the just Sum that would be then due.

1. A Merchant buys certain Merchandizes, to the Value of 648l. payable in 12 Months. I would know how much ready Money he is to pay, the Rebate at 8 per Ct. per Annum? *Answ.* 600l.

Example.

l. 100			
8			
—	l.	l.	l
If 108—100—648	<i>Answ.</i> 600 ready Money.		
	48 Rebate.		
	—		
	648l.		

2. How

2. How much is the Rebate of 7080l. 15s. in 12 Months, at 8 per Ct. per Annum? *Answ.* 524l. 10s.

3. How much is the Rebate of 100l. for 12 Months, at 8 per Ct. per Annum? *Answ.* 7l. 8s. 1 $\frac{2}{3}$ d.

4. I demand how much ready Money I must pay for 432l. 14s. for 12 Months, Rebate at 7 per Ct. per Annum? *Answ.* 404l. 7s. 10 $\frac{22}{107}$ d.

5. What is the Rebate of 45l. 15s. 6d. for 12 Months, at 6 per Ct. per Annum? *Answ.* 2l. 11s 9 $\frac{45}{33}$ d.

—II.—

6. How much is the Rebate, of 530. in 9 Months, at 8 per Ct. per Annum? *Answ.* 30l.

Example.

m. p: Ct. m.
If 12—8—9 comes 6
100.

If 106—6—530 *Answ.* 30l.

7. How much is the Rebate of 308l. 15s. in 18 Months, at 8 per Ct. per Annum? *Answ.* 33l. 1s. 7 $\frac{2}{7}$ d.

8. Tell me the Rebate of 112l. 12s. in 30 Months, at 7 per Ct. per Annum? *Answ.* 16l. 15s. 4 $\frac{9}{7}$ d.

9. One is indebted 273l. 10s. payable in 21 Months, I demand how much ready Money he is to pay, the Rebate at 6 per Ct. per Annum? *Answ.* 247l. 10s. 2 $\frac{158}{21}$ d.

10. Some Merchandizes being bought for 5150l. with $4\frac{1}{2}$ Months Rebate, at 8 per Ct. per Annum, besides 1 per Ct. for prompt payment, I would know how much ready Money it comes to? *Answ.* 4950l.

—III.—

11. A is indebted to B. 432l. payable in 12 Months, more 580l. payable in 2 Years; now if A has a Mind to pay both these Sums immediately, the Rebate 8 per Ct. per Annum, how much must he pay? *Answ.* 900l.

Example.

In 1 Year 1. 1.

If 108—100—432 comes 400l.

In 2 Years

If 116—00—580 comes 500l.

Answ. 900l.

12. What is the Rebate of 756l. the one half payable in 6 Months, and the other half in 6 Months after that, at 7 per Ct. per Annum? *Answ.* 37l. 1 s. $2\frac{1}{2}\frac{9}{4}\frac{1}{6}$ d.

13. How much ready Money must one pay for 1000l. of which 300l. are payable in 1 Year, 300l. in 2 Years, and the Rest in 3 Years. discounting at 8 per Ct. per Annum? *Answ.* $858\frac{7}{8}\frac{9}{10}\frac{2}{11}$ l.

14. A owes B 2000l. of which 690l. are to be paid in 15 Months, 350l. in 18 Months, 710l. in 21 Months, and the Remainder in 24 Months, I demand how much ready Money he must pay, rebating 8 per Cent. per Annum? *Answ.* 1778l. $\frac{3527}{36566}$ or 1778l. 1s. $11\frac{5031}{18183}$ d.

—IV—

—IV.—

15. A Merchant is indebted 2163l. 3s. payable in 12 Months. I demand how much he must pay, if he pays it at the Expiration of 5 Months, discounting at the Rate of 6 per Ct. per Annum? *Answ.* 2090l.

Example.

m.				
	12			
	5			
m.	—			

If 12—6—7 comes $3\frac{1}{2}$

	100			
	—			
		l.	s.	
If 103 $\frac{1}{2}$	—100—	2163	: 3	
	—			

Answ. 2090l.

16. If the aforesaid Sum was paid in 3 Months, how much ought he then to pay Rebate as before? *Answ.* 2070l.

17. A Merchant owes 110l. payable in 20 Months, and 224l. payable in 24 Months, the first Sum he pays in 5 Months, and the other one Month after that, discounting at 8 per Ct. per Annum. I demand the Sum he paid? *Answ.* 300l.

18. A is to pay the 7th of April, 1798, 5927l. and the 19th of June afterwards 5989l. how much is he to pay if he pays both these Sums the 24th of January, 1798, discounting at the Rate of 16 per Ct. per Annum? *Answ.* 11371l. 19 6 $\frac{1994}{3772}$ d.

G H A P.

CHAP. XXXI.

ALLIGATION MEDIAL.

SECT. I.

ALLIGATION MEDIAL teaches how to find a Mean in the Price, Quantity, or Quality, relating to the Mixture of Merchandizes, as Corn, Wine, Metals, Medicines, &c. one with another.

1. A Goldsmith has 18lb of Silver Bullion, of 8 Ounces fine, melts that with 24lb. of Bullion of 10 Ounces fine. I demand how fine each lb. of the Mixture is? *Answ.* $9\frac{1}{7}$ Ounces.

Rule. As the Sum of all the Quantities is to the Sum of their Rates, so is any Part of the Mixture to the mean Rate or Price.

Example.

lb.	oz.	oz.	
18 of	8	—	144.
24 of	10	—	240.
—	—	—	—
			lb:
If 42	—	—	384 —

Answ. $9\frac{1}{7}$ oz.

2. There are melted and mixed together, two Sorts of Silver, one sort is worth 5s. and the other 4s. an Ounce, and there were 4 Ounces of the first, and 8 Ounces of the latter, what is the Value of one Ounce of this Mixture? *Answ.* 4s. 4d.

3. Suppose 100lb. of Tobacco of $10\frac{1}{2}$ d. the lb. and 80lb. of 9d. the lb. and 60lb. of $9\frac{1}{2}$ the lb. are

are mixed together. I demand what 1lb. of this Mixture is worth? *Answ.* $9\frac{3}{4}$ d.

4. A Druggist has 200lb. of Ginger at 6d. the lb. 300lb. of 7d. the lb. and 400lb. of 8d. the lb. now if he mixes them together, what will 1lb. cost? *Answ.* $7\frac{2}{9}$ d.

5. 100 Casks of Butter, qt. 200Ct. 3qrs. 14lb⁸ at 18s. 8d. per Ct. are mixed with 150 Casks, qt. 306Ct. 1qr. 7lb. at 28s. per Ct. and with 200 Casks, qt. 420Ct. 3qrs. at 23s. 4d. per Ct. I demand what 1Ct. of the Butter stands in? *Answ.* 23s. $10\frac{1}{3}\frac{1}{6}\frac{2}{3}$ d.

6. A Goldsmith melts 8lb. $5\frac{1}{2}$ Ounces of Gold Bullion of 14 Caracts fine, with 12lb. $8\frac{1}{2}$ Ounces of 18 Caracts fine. I demand how many Caracts fine this Mixture is worth? *Answ.* $16\frac{5}{12}\frac{1}{7}$ Caracts.

7. A Refiner has 10lb. of Gold, of 20 Caracts fine, melts it with 16lb. of 18 Caracts fine, the Question is, how much Alloy must be put to it to make it 22 Caracts fine? *Answ.* 'Tis not fine enough by $3\frac{1}{3}$ Caracts, so no Alloy must be put to it, but more Gold.

C H A P. XXXII.

ALLIGATION ALTERNATE.

S E C T. I.

ALLIGATION ALTERNATE shows the due Proportion of Ingredients in any mixture when the particular Rates of the Ingredients and mean Rates are given, being (as it were) the Converse to Alligation Medial, and admits of three Cases.
Case

Case. 1. *The particular Rates of any ingredients proposed to be mixed, and the Mean Rate of the whole Mixture being given, to find how much of each Ingredient is requisite to compose the mixture, when the whole Quantity, or any Part thereof is not limited.*

1. How much Wheat at 6s. the Bushel, and Barley at 3s. 8d. the Bushel, will make a Mixture that may stand in 4s. 4d. the Bushel? *Ans.* 8 Bushels of Wheat, and 20 Bushels of Barley.

Rule, Take the Differences between the mean Rate, and the particular Rates, and set them down alternately, and they will be the Quantity required.

	Extre.	Pri.	Alt.	diff.	Proof.
Mean Pri. 52		72		8 Bush, at 72d. are 576	
		d.			
		44		20 Bush. at 34d. are 880	
				28 Bush. at 52d. are 1456	

NOTE, *The Questions in this, and all the other Sections, except the 4th and 7th, admit of more Answers than one; and yet all true; for although in the foregoing Question, 8 and 20 do answer it, yet there are many other Numbers that are in Proportion to one another, as 8 to 20, that will answer the Question; and tho' common Arithmetic will not obtain all the possible answers which the Questions in those Sections are capable of, nor often those which best suit the Purpose; yet by an algebraic way of Reasoning may be obtained all the possible answers to any Question in this Rule.*

2. How much Tobacco of $7\frac{1}{2}$ d. the lb. and $9\frac{3}{4}$ d. the lb. must be mixt, so that it will stand in $8\frac{1}{2}$ d. the lb.? *Ans.* $1\frac{1}{4}$ lb. at $7\frac{1}{2}$ d. and 1lb. at $9\frac{3}{4}$ d.

3. What

3. What Quantity of Sugar, at 11d. the lb. and 7½d. the lb. would make a Mixture, so that it would stand in 10¼d. the lb.? *Answ.* 3lb. at 11d. and ¾lb. at 7½d.

4. How many oz. of Silver of 11 oz. fine, and 8 oz. fine, must be melted together to make the Mass or Mixture 90z. fine? *Answ.* 1 oz. of 11 oz. fine, and 2 oz. of 8oz. fine.

—II.—

5. A Merchant has Sugar of 5d. 10d. and 12d. the lb. how much of each Sort must he take that he may sell a lb. for 8d.

Rule.

Join the single Extreme to all the other Extremes, and proceed as before.

	<i>Answ.</i>	<i>Proof.</i>
8 < $\begin{matrix} 5 \\ 10 \\ 12 \end{matrix}$)	- - 4 and 2 are 6 at 5d. is	30d.
	- - - - 3 at 10d.	30d.
	- - - - 3 at 12d.	36d.
		lb. 12 at 8d. 96d.

6. How much Sack of 6s. the Gallon, and white Wine of 4s. the Gallon, and Sherry of 4s. 9d. the Gallon, would be wanted to make a Mixture, so that a Gallon would stand in 4s. 6d.? *Answ.* 6 Gallons at 6s. and 6 Gallons at 4s. 9d. and 21 Gallons at 4s.

7. A Merchant has Wheat of 5s. 10d. the Bushel, and Barley of 4s. 2d. the Bushel, and Rye of 3s. the Bushel, how many Bushels of each Sort must

must he take to make a Mixture, so that the Bushel may stand in 5s. 5d.? *Answ.* 44 at 5s. 10d. 5 at 4s. 2d. and 5 at 3s.

8. A Vintner has Brandies at 3, 5 and 6s. the Gallon, and has a mind to mix a Quantity of them together, so that it may stand him in 5s. 6d. the Gallon; I demand how many Gallons he must take of each Sort? *Answ.* $\frac{1}{2}$ at 3s. $\frac{1}{2}$ at 5s. and 3 at 6s.

—III.—

9. A Grocer had Sugar of 5d. 7d. 12d. and 13d the lb. and mixed of each a certain Quantity together, and found it stood him in 10d. the lb. I demand how many lb. he took of each Sort? *Answ.* 3lb. of 5d. 2lb. of 7d. 3lb. of 12d. and 5lb. of 13d. Or otherwise.

Rule.

Join two Extremes together, no Matter which, so that one be larger than the mean, and the other less and set their Differences down, as before.

Example.

		Proof.		
		l.	s.	d.
40 {	5	<i>Answ.</i> 3lb. at 5d. are	-	0 : 1 : 3
	7	- - 2lb. at 7d. - - -	-	0 : 1 : 2
	12	- - 3lb. at 12d. - - -	-	0 : 3 : 0
	13	- - 5lb. at 13d. - - -	-	0 : 5 : 5
		13lb. at 10d. are	£.0	: 10 : 10
		Or		

Or thus,

Proof.

10 } 5
7
12
13

	l.	s.	d.
<i>Answ.</i> 2lb. of 5d. are	0	0	10
- - 3lb. of 7d. —	0	1	9
- - 5lb. of 12d.—	0	5	0
- - 3lb. of 13d.—	0	3	3

13lb. at 10d. are £.0 : 10 : 10

10. A Wine Merchant has 4 Sorts of Wines, viz. of 20d. 16d. 12d. and 7d. the Quart how much of each Sort must he take to sell a Quart for 14d. ? *Answ.* 6 Quarts of 7d. 2 Quarts of 12d. 2 Quarts of 16d. and 7 Quarts of 20d. or otherwise.

11. A Goldsmith has Gold of 17, 18, 22, and 24 Caracts fine, how much must he take of each to make it 21 Caracts fine ? *Answ.* 3 Caracts of 17, 1 Caract of 18, 3 Caracts of 22, and 4 of 24 fine.

—IV.—

Case 2, called *Alligation Partial*. The particular Rates of all the Ingredients proposed to be mixed, the Mean Rates of the whole mixture and any one of the Quantities to be mixed, being given, thence to find how much of every one of the other ingredients is requisite to compose the mixture.

12. A Refiner has Silver Bullion of 9 oz. fine. I demand how much Alloy must be put to it to bring it to 7 oz. fine ? *Answ.* $3\frac{3}{4}$ oz.

NOTE, Set down all the particulars, and find their Differences as before, without any Regard to the Mass

T

or

or Quantity to be mixt, which here is 12, because a Pound or 12 oz. of Silver being tried a certain time in the Fire, losing nothing in Weight, is esteemed 12oz. fine, but if it loses 3oz. 'tis called 9 oz. fine and if it loses 2 oz. it is called 10oz. fine, &c.

R U L E.

As the Difference standing against the Quantity given, is to the Quantity or Mixture given, so is any other difference to the Quantity sought.

Example.

Note, the (0) stands here for Alloy.

$$7 \begin{array}{c} \swarrow 0 \\ \searrow 9 \end{array} \left| \begin{array}{c} 2 \\ 7-12-2 \end{array} \right. \text{Answ. } 3\frac{1}{7}.$$

Proof.

Silver 9 oz.

Alloy 3 oz.

12

Alloy Added $3\frac{1}{7}$

If $15\frac{1}{7} - 9 - 12$ comes 7 oz.

13. How much Alloy must be put to Bullion of 10 oz. fine, to bring it to $7\frac{1}{4}$ oz. fine? *Answ.* $4\frac{1}{2}$ oz.

14. How much Alloy must be put to Gold of $22\frac{5}{8}$ Caracts, to bring it to $17\frac{1}{2}$ Caracts fine? *Answ.* $5\frac{3}{5}$ Caracts.

NOTE, An ounce of Gold being tried in the Fire, losing nothing in Weight, is called 24 Caracts fine, but if it loses 3 Caracts 'tis called 21 Caracts fine, and if it loses 4, 'tis called 20 Caracts fine, &c.

15. How

15. How much Water must I mix with 63 Gallons of Brandy of 5s. 5d. the Gallon, so that it may stand in 4s. 6d. the Gallon? *Ans.* $12\frac{5}{8}$ Gallons.

16. How much wheat of 6s. the Bushel must be mixed with 12 Bushels of Barley of 3s. 8d. the Bushel, so that the whole Mixture may stand in 4s. 4d. the Bushel? *Ans.* $4\frac{4}{5}$ Bushels.

—V.—

17. How much Brass of 14d. and Pewter of 10 $\frac{1}{2}$ d. the lb. must I melt with 50lb. of Copper worth 16d. the lb. so that the whole mixture may stand in 1s. the lb.? *Ans.* 200lb. at 10 $\frac{1}{2}$ d. and 50lb. at 14d.

$$\begin{array}{rcl}
 12 \left\{ \begin{array}{l} 10\frac{1}{2} \\ 14 \\ 16 \end{array} \right. & \begin{array}{l} - 6 \\ - 1\frac{1}{2} \\ - 1\frac{1}{2} \end{array} & \begin{array}{l} \text{Ans.} \\ 50 < \begin{array}{l} 6 \\ 1\frac{1}{2} \end{array} \left| \begin{array}{l} 200 \text{ at } 10\frac{1}{2}\text{d.} \\ 50 \text{ at } 14\text{d.} \end{array} \right. \end{array}
 \end{array}$$

lb. Proof.

200 at 10 $\frac{1}{2}$ d. are - 2100

50 at 14d. are - 700

50 at 16d. are - 800

————— lb.
If 300 ————— 600 ——— 1 comes 12d.

18. How much Gold of 21 and 23 Caracts fine must be mixed with 30 oz. of 20 Caracts fine to bring it to 22 Caracts fine? *Ans.* 30 of 21, and 90 of 23.

19. With 60 Gallons of Brandy at 6s. the Gallon, I mixed Brandy of 5s. 4d. the Gallon, and some Water. then I found it stood me in 3s. 6d. the Gallon, I demand how much Brandy, and how much Water I took? *Ans.* 60 Gallons at 5s. 4d. and $74\frac{2}{7}$ Gallons Water.

—VI.—

20. How much Malaga of 7s. 5d. the Gallon, and Sherry of 5s. 2d. the Gallon, and White Wine at 4s. 2d. the Gallon, must be mixed with 20 Gallons of Canary at 6s. 8d. the Gallon, so that one Gallon of the Mixture may stand in 6s. the Gallon? *Ans.* 44 Gallons at 7s. 5d. 16 Gallons at 5s. 2d. and 34 Gallons at 4s. 2d.

$$\begin{array}{rcl}
 72 \left\{ \begin{array}{l} 80 \\ 62 \\ 50 \\ 30 \end{array} \right. & \begin{array}{l} - - 22 \\ - - 8 \\ - - 17 \\ - - 10 \end{array} & \begin{array}{l} \\ \\ \\ - 20 \end{array} \\
 & & \begin{array}{l} \swarrow \quad \searrow \\ 22 \quad 8 \\ \quad \quad 17 \end{array} \left. \vphantom{\begin{array}{l} 22 \\ 8 \\ 17 \end{array}} \right\} \text{Ans.} \left\{ \begin{array}{l} 44 \\ 16 \\ 34 \end{array} \right. \text{ Gall.}
 \end{array}$$

Proof.

44 at 89d. are 3916
 16 at 62d. are 992
 34 at 50d. are 1700
 20 at 80d. are 1600

—————
 If ~~xx4~~ ———— ~~\$20\$~~ ———— 1 comes 72.

21. How much Alloy, and how much Gold of 21 and 23 Caracts fine, must be put to 300z. of 20 Caracts fine, to bring it to 18 Caracts fine? *Ans.* 16 $\frac{2}{3}$ oz. Alloy, 30 oz. of 21, and 30 oz. of 23 Caracts fine.

22. How do you prove the above *Answer* to be right? *Ans.* Thus,

oz.

oz.				
16 $\frac{2}{3}$	Alloy		Car.	
30 of 21	are	- -	630	
30 of 23	are	- -	690	
30 of 20	are	- -	600	
			Car.	fine
If 106 $\frac{2}{3}$ -----			1920	1 comes 18

23. How much Lead of 2 $\frac{1}{2}$ d. the lb. Pewter of 10d. the lb. and Brass of 16d. the lb. must I melt or mix with 112lb. of Copper of 18d. the lb. so that 1lb. of this mixture may stand me in 12d.?
Ans. 224 at 2 $\frac{1}{2}$ d. the lb. 336 at 10d. and 532lb. at 16d. the lb.

—VII.—

24. How much fine Silver must be put in Bullion of 8 $\frac{1}{2}$ oz. fine to bring it to 100z. fine? *Ans.* 9oz.

Rule:

As the Difference of the greater Fineness and the Mass is to the Difference of the lesser Fineness and greater, so is the Mass or Quantity to the Quantity required.

$$12 \begin{array}{c} \diagup 10 \\ \diagdown 8 \frac{1}{2} \end{array} \bigg| \begin{array}{c} 1 \frac{1}{2} \\ 2 \end{array} \text{ --- } 1 \frac{1}{2} \text{ --- } 12 \text{ } \textit{Ans. 9 oz.}$$

Or thus,

Subtract the Fineness one from another, the remainder multiply by the Mass or Quantity, that Product divide by the Difference of the Mass and the greater Fineness, and you have the Fineness required.

T 3

Greater

$$\begin{array}{r}
 \text{Greater Fineness } 10 \\
 \text{Lesser } \text{---} 8\frac{1}{2} \\
 \hline
 1\frac{1}{2} \\
 12
 \end{array}$$

Difference between
the Mass and great-
er Fineness, $\left. \begin{array}{l} 28 \\ 2 \end{array} \right\} 9$

Proof.

fine $8\frac{1}{2}$

fine 9

Bullion 12

Fine - 9

If $21\text{---}17\frac{1}{2}\text{---}12$ comes 10 oz.

25. A Refiner has 28lb. of Silver Bullion of $8\frac{1}{2}$ oz. fine, how much fine Silver must he put to it to bring it to 10 oz. fine? *Answ.* 21lb.

26. A Goldsmith has Gold of $19\frac{1}{3}$ Caracts fine, how much fine Gold must be put to it to bring it to $23\frac{1}{2}$ Caracts fine? *Answ.* 200 Caracts.

—VIII.—

Case 3, called *Alligation Total*. The particular Rates of all the Ingredients proposed to be mixed, and the Sum of all their quantities, with the mean Rate of that Sum, being given, to find the particular quantities of the mixture.

27. A Tobacconist has two Sorts of Tobacco, viz. of 18d. and 9d. the lb. and has a mind to mix 112lb. so that it may stand him in 16d. the lb. I demand how much he must take of each? *Answ.* $87\frac{1}{9}$ lb. of 18d. and $24\frac{8}{9}$ lb. of 9d.

Rule. As the Sum of all the Differences is to the Sum of all the Quantities given, so is every particular Difference to its particular Quantity.

Example

Example.

$$\begin{array}{rcl}
 16 & \swarrow \quad \searrow & \begin{array}{c} 18 \mid 7 \\ 2 \end{array} \\
 \hline & & \text{lb.} \\
 9 \text{ --- } 112 & \swarrow \quad \searrow & \begin{array}{l} 7 \text{ comes } 87\frac{1}{8} \\ 2 \text{ comes } 24\frac{8}{9} \end{array} \\
 \text{Proof.} & & \hline
 \end{array}$$

87 $\frac{1}{8}$ at 18d. are 1568

24 $\frac{8}{9}$ at 9d. are 224

112

lb.

If 112 ————— 1792 ————— -1 *Ans.* 16d.

28. A Goldsmith has two Sorts of Silver Bullion, the one of 10 oz. fine, and the other of 5 oz. fine, and has a Mind to mix a lb. of it, so that it shall be 8 oz. fine. I demand how much of each he must take? *Ans.* 4 $\frac{4}{5}$ of 5 oz. fine, and 7 $\frac{1}{5}$ of 10 oz. fine.

29. A Grocer has Sugar of 12d. the lb. and of 6 $\frac{1}{2}$ d. the lb. and has a mind to mix two Hundred wt. of it, so that he may sell it at 8d. the lb. I demand how much of each Sort he must take? *Ans.* 162 $\frac{1}{11}$ of 6 $\frac{1}{2}$ d. and 61 $\frac{1}{11}$ lb. at 12d.

30. A Refiner has Silver of 11 $\frac{1}{2}$ oz. fine, and of 7oz. fine, and has a Mind to make up a Piece of Work requiring 35lb. of 9 $\frac{3}{4}$ oz. fine, how much must he take of each? *Ans.* 21 $\frac{7}{8}$ lb. of 11 $\frac{1}{2}$ oz. fine, and 13 $\frac{1}{8}$ lb. of 7 oz. fine.

31. Brandy of 3s. 6d. and 5s. 9d. the Gallon is so to be mixed, that a Hhd. of 63 Gallons may be sold for 12l. 12s. I demand how many Gallons must be taken of each? *Ans.* 14 Gallons of 5s. 9d. and 49 Gallons of 3s. 6d.

—IX.—

32. A Grocer had Sugar of 12, 10, and 5d. the lb. and mixed 112lb. of it, and then he found it stood him in 8d. the lb. I demand how many lb. he took of each Sort? *Ans.* 28lb. of 12d. 28lb. of 10d. and 56lb. of 5d.

Example.

8 } ¹² ¹⁰ ⁵	) ------------------ ------------------ 4&2are6	< 3 3 6	28lb. at 12d. 1 : 8 : 0 28lb. at 10d. 1 : 3 : 4 56lb. at 5d. 1 : 3 : 4	<i>Proof.</i> l. s. d. 112 at 8d. are £.3 : 14 : 8
--	--	---	---	--

33. A Vintner has 3 Sorts of Wine, viz. of 24d. 22d. and 18d. the Gallon, now he has a Mind to mix a Cask of 60 Gallons, so that he may sell it at 20d. the Gallon, how much must he take of each? *Ans.* 12 at 24d. 12 at 22d. and 36 at 18d.

34. A Goldsmith has 3 sorts of Silver, viz. of 11, 8, and 5 oz. fine, and has a Mind to make a Piece of Work that shall weigh 10lb. of 9 oz. fine, how much of each must he take? *Ans.* $5\frac{1}{2}$ lb. of 11 oz. fine, $2\frac{2}{3}$ lb. of 8oz. fine, and $2\frac{2}{3}$ lb. of 5 oz. fine.

35. A Cask of 58 Gallons is filled with Liquor of 7, 8, and 10d. the Gallon, and then it stands in $9\frac{1}{4}$ d. the Gallon, I would know how many Gallons of each sort was taken? *Ans.* $40\frac{3}{4}$ Gallons of 10d. $8\frac{7}{8}$ Gallons of 8d. and $8\frac{7}{8}$ of 7d.

—X.

—X.—

36. A Merchant has Brandy of 3, 5, 6, and 7s. the Gallon, and has a Mind to fill a Cask of 40 Gallons, so that he may sell it at 5s. 6d. the Gallon, how many Gallons must he take of each? *Answ.*

Example.

$$\begin{array}{r} s. \left\{ \begin{array}{l} 3 \\ 5 \\ 6 \\ 7 \end{array} \right. \end{array} \begin{array}{r} - 0\frac{1}{2} \\ - 1\frac{1}{2} \\ - 2\frac{1}{2} \\ - 0\frac{1}{2} \end{array}$$

$$\begin{array}{r} 5-40 \end{array} \begin{array}{l} \swarrow 0\frac{1}{2} \\ \swarrow 1\frac{1}{2} \\ \swarrow 2\frac{1}{2} \\ \swarrow 0\frac{1}{2} \end{array}$$

40 at 5½s. are 11 : 00 : 0

Proof.

Answ. l. s. d.

4 at 3s. 0 : 12 : 0
12 at 5s. 3 : 00 : 0
20 at 6s. 6 : 00 : 0
4 at 7s. 1 : 08 : 0

Or this Way.

$$\begin{array}{r} s. \left\{ \begin{array}{l} 3 \\ 5 \\ 6 \\ 7 \end{array} \right. \end{array} \begin{array}{r} - 1\frac{1}{2} \\ - 0\frac{1}{2} \\ - 0\frac{1}{2} \\ - 2\frac{1}{2} \end{array}$$

$$\begin{array}{r} \text{If } 5-40 \end{array} \begin{array}{l} \swarrow 1\frac{1}{2} \\ \swarrow 0\frac{1}{2} \\ \swarrow 0\frac{1}{2} \\ \swarrow 2\frac{1}{2} \end{array}$$

40 at 5½s. are 11 : 00 : 0

Proof.

Answ. l. s. d.

12 at 3s. 1 : 16 : 0
4 at 5s. 1 : 00 : 0
4 at 6s. 1 : 04 : 0
20 at 7s. 7 : 00 : 0

37. A Tobaceonist has Tobacco of 5½d. 7¾d. 12½d. and 15¼d. the lb. makes up 4 Boxes of them of 22lb. each, so that it stands him in 9¼d. the lb. I want to know how many lb. he took of each Sort? *Answ.* 22½lb. of 15¼d. 9¾lb. of 12½d. 19½lb. of 7¼d. and 36½lb. of 5½d. or otherwise.

38. A Mer-

38. A Merchant has certain Merchandizes, some of 9d. some of 12d. some of 24d. and some of 30d. the lb. how much of each Sort must he take to make up 99lb. so that they may stand him in 20d. the lb.? *Answ.* 24lb. at 30d. 33lb. of 24d. 30lb. of 12d. and 12lb. of 9d. or otherwise.

39. A Druggist has Drugs of 18, 15, 12, 9, 8, and 5d. the lb. how much must he take of each Sort to make up 318lb. so that they may stand him in 11d. the lb.? *Answ.* $82\frac{2}{3}$ lb. of 18d. $41\frac{1}{3}$ lb. of 15d. $27\frac{1}{3}$ lb. of 12d. $13\frac{2}{3}$ lb. of 9d. $55\frac{2}{3}$ lb. of 8d. and $96\frac{1}{3}$ lb. of 5d. or otherwise.

40. It is required to make up 100l. to consist of one Hundred Pieces, viz. of Moldores of 3 s. Guineas of 23s. and Pistoles of 18s. 6d. *Quer.* how many of each must be taken to make the Sum of one Hundred Pounds? *Answ.* 6 at 30s. 18 at 23s. and 76 at 18½s.

C H A P. XXXIII.

SINGLE FALSE POSITION.

S E C T. I.

THIS Rule is so called, because by supposed Numbers taken at Adventure, and working therewith, according to the Nature of the question, as if it were the true Number, the true Number sought is discovered.

1. Suppose the Ages of three Persons make together 144 Years, and that the Age of the second is double the Age of the first, and the Age of the third, is treble the Age of the second, what is the Age of each Person? *Answ.* 16, 32 and 96 Years.

Rule.

Rule.

As the result of your Position is to the Position, so
is the given Number to the true Number sought.

Suppose,

The first Man's Age 1
then the 2nd must be 2
then the 3d. must be 6

—
If $9-1-144$ comes 16

If $9-2-144$ ——— 32

If $9-6-144$ ——— 96
—

Proof 144

2. Three Merchants made up a Stock of 500l.
B put in twice as much as A, and C four Times
as much as B, how much did each of them put in?

Answ. A $45\frac{3}{11}$ l. B $90\frac{6}{11}$ l. C $363\frac{2}{11}$ l.

3. There is a Cistern of Water which has 3
Cocks, when the greater, or first Cock is opened,
all the Water runs out in one Hour, when the
second Cock is opened, it runs out in two Hours,
and when the third Cock is set open, it runs out
in three Hours in what Time will all the Water
run out if all the Cocks are set open at once?

Answ. In $32\frac{8}{11}$ Minutes.

4. What Number is it whose $\frac{1}{6}$, $\frac{1}{7}$, and $\frac{1}{8}$ Parts
make $16\frac{1}{2}$? *Answ.* 42.

5. Peter drinks a Cask of Beer out, qt. 16 Gal-
lons in 6 Days, and John when he goes about it
does it in 4 Days; now if they both should drink
together, in what Time would they make an End
of it? *Answ.* in 2 Days $9\frac{3}{5}$ hours.

6. Three Persons, A, B, and C, discoursing con-
cerning their Age, says B to A, I am as old, and
half

half again as old as you, then says C to B, I am twice as old as you, now says A to them both, I am sure the sum of all our Ages is 154 Years, I demand each Man's Age? *Answ.* A 28, B 42, and C 84.

7. A Gamester loses, in 4 Turns at Dice, 160 Shillings, and trebled each Turn the Sum he put in. How could he know for how much he played the first and last Time? *Answ.* 4s. and 108s.

8. Forty Yards of Drugget, and 50 Yards of Cloth cost 2 l. 10s. but every Yard of Cloth cost double as much as a Yard of Drugget, I demand what a Yard of Drugget cost? *Answ.* 3s. 6d.

9. Suppose I lend at Interest a certain Sum of Money, at the Rate of 8 per Ct. simple Interest, and that at the end of 10 Years, I received both for Principal and Interest 600l. I demand how much was the Principal Sum I lent at first? *Answ.* 33 l. 6s. 8d.

—II.—

10. A Master Mason when he works alone, can finish a Piece of Work in $2\frac{1}{2}$ Days, his Journeyman can do the same in $3\frac{3}{4}$ Days, and his Apprentice can do it in $4\frac{1}{2}$ Days; now, I demand in what Time they would finish the Work, if all three together went about it? *Answ.* In 1 Day 3 Hours.

Suppose

To work this Rule make Choice of any Number, and work with it according to the Nature of the Question, as per Example : I suppose the Horse cost 20l. which I multiply by 6, comes 120l. and add 4, makes 124, which ought to be but 100, ergo, too much by 24, which I call the first error, and mark it thus, (+) signifying more : Again I suppose the Horse cost 14l. which being worked as before, comes 12 too little, which is the second Error, and mark it thus (—) signifying less : then add the Errors more and less together, comes 36 for a Divisor, then multiply the Positions and their Errors cross-wise, and their Product add, the Sum divide by 36 (the Divisor) and the Quotient is the Answer required.

NOTE, When the signs of more or less are alike, subtract, but when unlike, add.

Example.

Suppose 20	Suppose 14	
6	6	+24
120	84	—12
add 4	4	
		36 Divisor
124	88	
100	100	
24+	12—	16
20	14	6
240	336	96
	240	4
		100 Proof
	376	
	366	
	3	
	} 16 Ans.	

Or thus,

NOTE, Plus, or more, subtract from the middle Number, Minus, or less, add to the middle Number, (=) this signifies equal.

$$\begin{array}{r} 1\ a \\ 6 \end{array}$$

If $6\ a + 4 = : 100$ what is $1\ a$

$$\begin{array}{r} 4 \\ \hline \end{array}$$

$$\begin{array}{r} 96 \\ 66 \end{array} \left. \vphantom{\begin{array}{r} 96 \\ 66 \end{array}} \right\} 16\ \text{Answ.}$$

2. One being asked how old he was? answered, if my Age was doubled, the Half, and the Quarter of my Age added to it, more one Year, I should be 100 Years old; what is his Age? *Answ.* 36 Years.

3. I being asked how long I had kept School, I answered, if you treble the Years, and add to it the Half and the Quarter of the Years more $\frac{3}{4}$, it will be $34\frac{1}{2}$ Years. I demand the Time? *Answ.* 9 Years.

4. If the Number of my Scholars was doubled, the $\frac{1}{2}$, and the $\frac{1}{4}$ of the Number added to it, more 30, they would be 250, how many are they? *Answ.* 80.

5. One asked how many Pence I had in my Pocket, I told him that my Pence, with $\frac{1}{2}$, and $\frac{1}{4}$ with $\frac{1}{8}$ together less 2, would make 43d. well then, says he, you have 24d.? *Answ.* Right.

6 If I made my Money 8 Times more than it is, and gave 6 Times 6 of it to the Poor, and divided the Rest of it by 4. and then I find that every Part is 21 Crowns, tell me how many Crowns I had? *Answ.* 15 Crowns.

7. A asked B to lend him the 100 Crowns he had in his Pocket, B answered he had not so many, but says he, if I had Half as many more as I have, with $\frac{1}{4}$ and $\frac{1}{8}$ and $\frac{1}{6}$ of the number of Crowns which I have, less 3, there would be 46, well then says A, I find you have only 24 Crowns? *Answ.* Just as many.

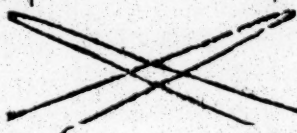
8. A Man on Horseback sets out from a certain Town, and a Coach sets out from another Town, at a certain distance they meet, the Coachman asks the Man on Horseback how many Miles he had rode, he answered, that if he had rode $1\frac{1}{2}$ Times as far again as he had done, he would have rode 36 Miles; well then says the Coachman, I have rode $\frac{1}{2}$ as far, and $\frac{1}{4}$ as far as you, now tell me how many Miles the Towns are asunder? *Answ.* $25\frac{1}{5}$ Miles.

—II.—

9. Divide 15 into two such Parts, that when the greater is multiplied by 4, and the less by 16, their Products must be equal? *Answ.* 12 and 3

Example.

Example.

Suppose and 6 <u>4 16</u> 36 96 36 <u> </u> 60+	Suppose 10 and 5 <u>4 16</u> 40 80 40 <u> </u> 40+
	
<u>9 6</u> 360 240	<u>10 5</u> 600 300 360 240 <u> </u> 240 60 20 <u> </u> 12 3 4 16 <u> </u> Proof 48 48

10. A Master hires a Journeyman on this Condition, that he shall have 12d. a Day, and his Diet, for every Day he works, but for every Day he does not work, he is to pay his Master 6d. for his Diet; now the 30th Day they come to an Account, but neither of them receives or pays any Money. I demand how many Days he worked, and how many Days he was idle? *Ans.* He worked 10 Days and was idle 20.

U 3

11. What

11. What Numbers are they, that when you add them they make $266\frac{2}{3}$, and when you multiply the one by 5, and the other by 3, their Products shall be equal? *Answ.* $166\frac{2}{3}$, and 100.

12. There are two Numbers, when they are added together make 102, and the one multiplied by 15, is the same as the other being multiplied by 21, what are those Numbers? *Answ.* $59\frac{1}{2}$ and $42\frac{1}{2}$.

13. Divide 21, into two such Parts, that when the greater is divided by the less, and the less by the greater, and afterwards the greater Quotient multiplied by 5, and the less by 125, their Products shall be equal? *Answ.* $17\frac{1}{2}$, and $3\frac{1}{2}$.

—III.—

14. A Master hires a Servant for 40 Days, when he works he is to have 15d. a Day, and when he is idle, he is to pay his Master 4d. a Day; at the End of 40 Days they come to an Account, and the Servant receives 23 Shillings and a Penny; tell me how many Days he wrought, and how many he was idle? *Answ.* He wrought 23 Days, and was 17 Days idle.

Example

Example.

Suppose,		Suppose,	
wk'd 25 at 15d. 375		24 at 15d. 360	
idle, 15 at 4d. 60		16 at 4d. 64	
—		—	
40	315	40	296
should be	277		277
s. d.			
23 : 1	+38	+19	38+
12			19+
—			—
277d.			19
	25	24	
	—	—	
	475	912	
		475	
		—	
	437		s. d.
	299	23 at 15d.	28 9
	x	17 at 4d.	5 8
		—	—
	Proof 40	23 : 1	

15. A Merchant has 100 Barrels of Wheat and Barley, which cost him 46l. 10s. the Wheat stands him in 12s. and the Barley in 6s. the Barrel, tell me how many Barrels he has of each? *Answ.* 55 of Wheat, and 45 of Barley.

16. There are two Numbers, when you add them they make 100, and when you multiply the greater by 3, and the less by $4\frac{7}{8}$, their Difference is $4\frac{1}{16}$, what are those Numbers? *Answ.* $62\frac{1}{2}$, and $37\frac{1}{2}$.

17. A Goldsmith has two Masses of Silver, wt. together 24lb. the heaviest at 5s. and the lightest at 5s. 4d. the oz. amounting together to 74l. 4s. Tell me how much each Mass weighed? *Answ.* 13lb. and 11lb.

18. There are two Numbers which when added make 35, if you divide the less by 4 and the greater by 3, their Quotients being added will make 11. I demand the Numbers? *Answ.* 27 and 8.

19. A departs from Dublin, at the same Time that B departs from Cork, A is bound for Cork, and B for Dublin, each keeping the same Road, and the Distance between Dublin and Cork, suppose 100 Miles; when they meet, the Miles A had travelled being multiplied by $3\frac{3}{4}$, and the Miles B had travelled being multiplied by $5\frac{1}{4}$, the Difference of their Product will be $75\frac{3}{4}$. I demand how much farther the one went than the other? *Answ.* A went farther by $33\frac{1}{2}$ Miles.

—IV.—

20. A and B go out of a Town, keeping both the same Road, but A goes every Day 8 Miles, and B goes the first Day one Mile, the second Day 2 Miles, and so on, every Day one Mile more. I demand when B will overtake A? *Answ.* In 15 Days.

Example.

Example.

Suppose A 5 B 1

8	2
—	3
40	4
15	5
—	—
28	15
8—	

5—	4—
5	7
20	35
	20

Suppose A 7 B 1

8	2
—	3
56	4
28	5
—	6
28	7
4—	—
	28

5—
4—
1

28 } 15 Days.
20 }

21. There are two Master Masons, who are each to build a Wall of equal dimensions, A employs so many Men as finish in a Day $22\frac{1}{2}$ Perches, B employs, the first Day, as many men as finish 6 Perches, the second Day as many as finish 9 Perches, and so on, every Day 3 Perches more; in what Time will they have built an equal Number of Perches? *Answ.* In 12 Days.

22. A Gentleman hires 2 Labourers, to the one he gives constantly 9d. a Day, to the other he gives the first Day 2d. the second Day 4d. the third Day 6d. and so on, every Day 2d. more. I demand in how many Days they will have earned equal Money? *Answ.* In 8 Days.

23. A and B buy an equal Quantity of Cloth, and lay out an equal Quantity of Money, A gives 7s. for every Yard he buys, and B. gives 2s. for the

the first Yard, and 4s. for the second Yard, and so on, 2s. more for each Yard. I want to know how many Yards they bought and how much Money they laid out? *Answ.* 6 Yards, and laid out 42s. each.

—V.—

24. What Numbers are they, that when added make 25, and when you half the one, and double the other, their Sums shall be equal? *Answ.* 20 and 5.

Example.

Suppose
14 and 11
double 11
 $\frac{1}{2}$ is 7—

22
7
—

15+

14

70

Suppose
18 and 7
double 7
 $\frac{1}{2}$ is 9—

14
9
—

5+

18

270

70

200 }
100 } 20

15+
5+
—
10

Consequently the other 5

25. One received 2 Heaps of Crowns making both together 36, the $\frac{1}{2}$ and $\frac{1}{4}$ of the first Heap, were equal to the $\frac{1}{4}$ and $\frac{1}{5}$ of the second Heap. I demand how many Crowns there were in each Heap? *Answ.* 12 and 24.

26. There

26. There are two Numbers, when you add them together they make 30, the $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{6}$ of the greater is equal to $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{4}$ of the less Number, tell me what are the Numbers? *Answ.* 12 and 18.

—VI.—

27. A and B discoursing of their money, says A to B, if you give me 3s. of your money, I shall have 5 Times as many shillings as you have left; no says B, it is better that you give me 5s. of yours, for then our money will be equal: how many shillings had each? *Answ.* A 17 B 7.

Example.

Suppose
A 22 B 8

3 3
— —

25 5
— —

22 8

5 5
— —

17 13

13 —
— —

4+

Suppose
A 12 B 6

3 3
— —

15 3
— —

12 6

5 5
— —

7 11

11 —
— —

4—

4+

4—

8

22 8

88 32

48 24

136 86

\$ — —

17 & 7

12 6

48 24

28. Says

28. Says A to B, give me 1s. of your Shillings, and I shall have double the Shillings that you have left; B answered, it is more reasonable that our Sums should be equal, and therefore, if you give me 1s. I shall have as many as you. I demand how many Shillings each had? *Answ.* A 7, and B 5.

29. If from a Piece of Cloth I cut $\frac{2}{3} + 11$ Yards, there is left $\frac{1}{2} - 17$ Yards, I demand how many Yards were in the whole Piece? *Answ.* 36 Yards.

—VII.—

30. What Number is it, whose $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{8}$ being multiplied together make 24? *Answ.* 8.

Example.

Suppose	Suppose
12 12	4 4
12 —	— 4
— $\frac{1}{2}$ is 6	— $\frac{1}{2}$ is 2
144 $\frac{1}{4}$ is 3	16 $\frac{1}{4}$ is 1
12 —	— 4
— 18	— 2
1728 $\frac{3}{8}$ is $4\frac{1}{2}$	64 $\frac{3}{8}$ is $1\frac{1}{2}$
81	3
Ought to be 24	24
57+	21—
1728	57+
36288	78
3648	3648
39936	
7888	
77	

$\left. \begin{array}{l} 39936 \\ 7888 \\ 77 \end{array} \right\} V^3 512 = 8$

Or

Or thus,

Suppose

1 a

$$\begin{array}{r} 1 \text{ --- } 1 \text{ --- } 3 \\ \text{---} \quad \quad \text{---} \quad \quad \text{---} \\ 2 \text{ --- } 4 \text{ --- } 8 \\ \hline \end{array}$$

If 1 a $\frac{3}{64} = 4$ what is 1 a
64

$$\begin{array}{l} 2836 \left\{ \begin{array}{l} 3 \\ 333 \end{array} \right. \sqrt{512} = 8 \end{array}$$

31. A asked B how old he was, B answered, if $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{8}$ of my Years are multiplid, their Product will be 192, tell me B's Age? *Answ.* 16 Years

32. What Number is it whose $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, and $\frac{1}{6}$ being multiplied together produces $6998\frac{2}{5}$? *Answ.* 36.

C H A P. XXXV.

Questions to exercise most of the RULES hitherto delivered, promiscuously set down.

T H E R E is a Mast or pole, $\frac{1}{9}$ of its Length stands in the Ground, 12 Feet of it in the Water, and $\frac{5}{6}$ of its Length in the Air, or above Water. I demand the Whole Length? *Answ.* 216 Feet.

2. If from a Piece of Cloth I cut $\frac{9}{16}$ —12 Yards then there is left $\frac{7}{8}$ +20 Yards I demand how many Yards there were in the Piece? *Answ.* 128 Yards.

X

3. Three

3. Three Merchants, A, B, C, have gained in Partnership 234l. which they are to divide in this Manner, when the Profit of A is multiplied by 2 and that of B by 3, and C's by 4, their products are to be equal. I demand how much each of them is to receive? *Answ.* A 108l. B 72l. and C 54l.

4. When 198lb. of London are carried 8 Miles for 25s. $7\frac{1}{2}$ d. how much must one give to carry 480lb. of Amsterdam 15 Miles, if 110lb. at London are equal to 100 at Amsterdam. *Answ.* 6l. 8s.

5. There is a Wall of 2000 Feet long, and $2\frac{1}{2}$ Feet thick, the Stones are $\frac{1}{2}$ Foot long, $\frac{1}{4}$ Foot broad, and $\frac{1}{8}$ Foot thick, including the Mortar, and in the whole Wall are 4000000 Stones. I demand the Height of the wall? *Answ.* $12\frac{1}{2}$ Feet.

6. What Numbers are they whose $\frac{1}{2}$, $\frac{1}{8}$, and $\frac{1}{2}$ of the one are equal to $\frac{1}{3}$, $\frac{1}{6}$, and $\frac{1}{9}$ of the other? *Answ.* 264 and 306.

7. There are two Pieces of Linen, the one is 9 Yards shorter than the other, and cost 3l. $1\frac{1}{5}$ s. the other Piece at the same Price cost 3l. 12s. I demand how many Yards there are in both Pieces, and the Price of one Yard? *Answ.* 111 Yards, at 15s. the Yard.

8. If with 100 Barrells of Beer, I mix $66\frac{2}{3}$ Barrells of Water, it is 3 Shilling Beer. I demand what Beer it was before? *Answ.* 5 Shilling Beer.

9. Tell me the Number whose half being divided by 6, its $\frac{1}{3}$ by 4, and its $\frac{1}{4}$ by 3, each Quotient shall be 9? *Answ.* 108.

10. A Piece of Sattin cost a certain Sum, and being sold for 3l. 10s. there is lost $\frac{2}{5}$ in a Shilling. I demand the first Cost? *Answ.* 5l. 16s. 8d.

11. A.

11. A has Brandy which cost him 4s. the Gallon, in Barter puts it at 4s. 6d. and gives 6 Months Time, B has Wine which stands him in 10l. 5s. the Hhd. and puts it at 11l. I demand how much Time B. must give to make the Barter equal? *Answ.* $3\frac{2}{3}$ Months.

12. A Sets out from Cork to Clonmell, at the same Time B sets out from Clonmell towards Cork, the Distance between both Places suppose 30 Miles, and both Persons keep the same Road. A goes every Day 2 Miles more than B, and the second Day they meet. I demand how many Miles a Day each of them has travelled? *Answ.* A. $8\frac{1}{2}$, and B. $6\frac{1}{2}$.

13. When a Bushel of Wheat cost 3s. 4d. the Penny Loaf weighs 12 Ounces, what shall a Loaf worth 9d. weigh when the Wheat is at 10s. 8d.? *Answ.* $33\frac{3}{4}$ Ounces.

14. If 12 Boarders drink in 7 Days half a Barrel of Beer, how long would the same last if 2 Boarders more came among them? *Answ.* 6 Days.

15. If a Hhd. of Wine be sold for 10l. there is lost 8 per Ct. how much is the Gain or Loss per Ct. when 5 Hhds. are sold for 45l. 10s.?

$16\frac{2}{3}$ per Ct. Loss.

16. Eight Persons, consisting of Men and Women, have spent together 5s. 4d. each Man 10d. and each Woman 6d. I demand how many Men and Women there were? *Answ.* 4 Men and 4 Women.

17. What is the Product of 19l. 19s. $11\frac{3}{4}$ d. being multiplied by 19l. 19s. $11\frac{3}{4}$ d.? 399l. 19s. 2 $\frac{1}{3840}$

X 2

18. If

18. I have a Bond $\frac{1}{4}$ whereof is present Payment, $\frac{1}{4}$ in 4, $\frac{1}{5}$ in 5, and the Remainder in 6 Months, in what Time might I receive the same without any Prejudice to myself? *Ans.* in 3 Months 9 Days.

19. How many Yards of Bays of $1 \frac{1}{6}$ Yards wide, will be wanted to hang a Room of $16 \frac{1}{2}$ Feet long, $12 \frac{1}{4}$ Feet broad, and $10 \frac{1}{4}$ Feet high? *Ans.* $62 \frac{12}{27}$ Yards.

20. A Fisherman being asked how much Fish he had caught? answered, that the $\frac{3}{8}$ of his Fish were Herrings, $\frac{1}{6}$ Whittings, $\frac{2}{5}$ Haddocks, and 21 Cods, now tell me how many he had in all, and how many of each Sort? *Ans.* 135 Herrings, 144 Haddocks, 60 Whittings, and 21 Cods, in all 360.

21. A Gentleman has at Work 3 Master Mafons, who have each 8 Journeymen, and earn in 5 Weeks (each Week counted 6 days) 43l. 4s. now the same gentleman employs in another Work 5 Master Mafons, who have each 10 Journeymen, who earn every Week (each Week $5 \frac{1}{2}$ Days) as much as the former. I demand how much they would earn in 8 Weeks? *Ans.* 132l.

22. Two Merchants enter into Partnership, and each of them puts in 12 Pieces of Cloth, but those of A. cost 48l. more than those of B. the Cloth being sold they find to have gained $273 \frac{3}{5}$ l. of which B. has for his Share $122 \frac{2}{5}$ l. to know at how much each Piece was valued? *Ans.* A's at 21l. and B's at 17l.

23. I once counted my Pence, and found that when I multiplied the $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$ of the Number, the Product was 162000d. tell me how many Shillings I had? *Ans.* 10s.

24. If

24. If 7 Persons drink 36 Gallons of Beer in 12 Days, how many Gallons will be drank out at that Rate in 8 Days by 14 Persons? *Answ.* 48 Gallons

25. One being asked the Hour of the Day, answered that the Time past from Noon was equal to $\frac{2}{3}$ of the Time remaining from Midnight. I demand what o'Clock it was? *Answ.* 36 Minutes past 1.

26. Three Merchants are in Company, their Stock is 400l. the Money of A continued in 5 Months, that of B 6 Months, and C's 9 Months, and they gain 375l. which they divide equal y. I demand the Stock each of them put in? *Answ.* A. $167\frac{1}{4}$, B $139\frac{3}{4}$, and C $93\frac{1}{4}$ l.

27. There is a certain Number, which if you divide by 7, its Quotient multiplied by 3, that Product divided by 5, from the Quotient subtract 20, to the rest add 30, and half the last Sum shall make 35. I demand the Number? *Answ.* 700.

28. A asked B his Age, B answered thus, If you square my Age and divide the Product by 2, the Quotient you'll find to be $55\frac{1}{8}$, well says A, then you are exactly $10\frac{1}{2}$ Years.

29. If 16 Men in 20 Days build a Wall of 25 Feet long, 6 Feet high, and 2 Feet thick: In how many Days will 80 Men build a Wall of 400 Feet long, 10 Feet high, and 3 Feet thick? *Answ.* In 160 Days.

30. A ship being mann'd with 300 Men, and provided with Bread for 12 Months, so that each Man has 30 Ounces a Day, but having been 6 Months on their Voyage, they find it will require 9 Months more before they can finish their Voyage, and also that they have lost 50 of their Men, now

X 3

tell

tell me how many Ounces of Bread each Man may have during the said nine Months, each Month 30 Days? *Answ.* 24 Ounces.

31. A Merchant sold Tobacco at 15d. the lb and lost at the Rate of 10 per Cent. he sold 100l worth more of the same Parcel. and gained 40 per Cent. tell me how many lb. there were in the last Parcel and at what Rate he sold it the lb.? *Answ* 1028 $\frac{1}{7}$ lb. at 23 $\frac{1}{3}$ d. the lb.

32. Four Persons hire a Coach, to go 100 Miles, for 9l. 10s. with Condition that if they take any Body in upon the Road, the Profit shall belong unto them, now, when they have been gone 40 Miles, they take into the Coach two Persons, with Condition, that they shall pay proportionably with the other 4 Persons. I demand how much each of them ought to pay? *Answ.* the 4 Persons, 7l. 6s. 1 $\frac{1}{3}$ d. and the 2 Persons, 2l. 3s. 10 $\frac{2}{3}$ d.

33. A Vintner has a Cask of Wine, qt. 500 Gallons; of which he draws 50 Gallons, and then fills it up with Water, and does so 5 Times. I demand how much Wine and how much Water there is left in the Cask? *Answ.* 295 $\frac{49}{100}$ Gallons of Wine, and 20 $\frac{151}{200}$ Gallons of Water.

34. If a Mother and 2 Daughters together, can spin 3lb. of Flax in 1 Day, and that the Mother alone can do it in 2 $\frac{1}{2}$ Days, and the eldest Daughter in 2 $\frac{1}{4}$ Days, in what Time could the youngest Daughter do it alone? *Answ.* In 6 $\frac{3}{7}$ Days.

35. A Merchant loads 2 Vessels, in A 150 Hhds. and in B 240 Hhds. of Wine, the Ships coming by a certain Pass, A pays for Toll 1 Hhd. and receives 12s. back, B pays also 1 Hhd. and 36s. more. I demand at how much each Hhd. was valued? *Answ.* 4l. 12s.

36. A Gentlemen bestows 1000l. in Legacies in this Manner, to A a certain Sum, to B $\frac{1}{4}$ more than to A, to C $\frac{1}{4}$ less than to A, and to D twice as much as to C. I demand how much each of them must have? *Answ.* A 222 $\frac{2}{9}$ l. B 277 $\frac{2}{9}$ l. C 166 $\frac{6}{9}$ l. and D 333 $\frac{3}{9}$ l.

37. When I sell a Yard of Cloth for 15d. I gain 10s. by the Piece, and when I sell the Yard for 14d. I gain 6s. by the same Piece? I demand how many Yards were in the Piece? *Answ.* 48 Yards.

38. Four Merchants have a certain Sum of Money to divide between them in this Manner, when A has $\frac{1}{4}$ of the whole Sum then B gets $\frac{1}{5}$, and when C gets $\frac{1}{5}$, then D must have $\frac{3}{5}$, now if D gets 150l. for his Share, I demand how much the others must have? *Answ.* A 100, B 80, and C 200l.

39. Bought 40 Yards of Cloth, of 2 $\frac{1}{4}$ Yards broad, but being made wet, did shrink in Length upon every 4 Yards half a Quarter, and in Breadth upon 1 $\frac{1}{2}$ Yard, one Nail and a half; to line this Cloth, I bought Bays of 5 Quarters broad, which being made wet, did shrink upon 20 Yards in Length the whole Breadth, and in Breadth it did shrink half a Nail. I demand how many Yards of Bays would line the said Cloth? *Answ.* 71 $\frac{7}{15}$ Yds.

40. In what time could I with 514l. gain 66l. 16s. 4 $\frac{4}{5}$ d. at the Rate of 8 per Cent. per Annum? *Answ.* In 19 $\frac{1}{2}$ Months.

41. If 4lb. of A weigh as much as 3lb. of B, and 5lb. of B as much as 4lb. of C, and 6lb. of C as much as 5lb. of D how many lb. of D are then as heavy as 240lb. of A? *Answ.* 120lb. of D.

42. There.

42. There is a certain Number of Horſe and Foot to be ferry'd over a River, and they agree to pay for 2 Horſes $2\frac{1}{2}d.$ and for 7 Foot $3\frac{1}{2}d.$ now when they were all over the Ferryman received 25l. 7 Foot always followed 2 Horſe. I demand how many Horſe and Foot there were? *Anſw.* 2000 Horſe and 7000 Foot.

43. Three Merchants put in together 100l: B puts in 3 Times as much as A, more 4l. and C puts in as much as A and B together, more 6l. I demand how much each of them put in? *Anſw.* A $10\frac{3}{4}l.$ B $36\frac{1}{4}l.$ and C 53l.

44. How many Pears can I have for 11 Shillings and 3d. if 70 Almonds are worth 50 Cheſnuts, and 48 Cheſnuts 1 Pomegranate, and 28 Lemons 18 Pomegranates, and 25 Pears 10 Lemons, and 108 Almonds coſt $2\frac{1}{4}d.$ *Anſw.* 375 Pears.

45. Three Fiſhermen have each of them caught a certain number of Fiſh, when the firſt and ſecond Man's Fiſh are put together they make 110, when the ſecond and third are put together, they make 130, and when the firſt and third are put by one another, then there are 120, now the Fiſh is to be divided equally among them, I demand each Man's Share, and how many each of them had caught? *Anſw.* 50, 60, and 70, and each Man had 60 for his Share.

46. If 6 Gallons of Brandy, and 4 Cobs, (each 4s. 9d.) ſtand in Proportion againſt 15 Gallons leſs 5 Cobs; what is the Price of 1 Gallon? *Anſw.* 1 Cob.

47. There are 2 Troopers, 25 Soldiers, and 18 Seamen, who have got a Booty of 897l. now according to Agreement, one Trooper muſt have

as much as two Soldiers, and 3 Soldiers as much as 5 Seamen, I demand each Man's Share? *Ans.*
A. Trooper 30l. a Soldier 15l. a Seaman 9l.

48. There is a Golden Cup, valued at 70 Crowns, and two heaps of Crowns, now when you put the Cup by one of the Heaps, they are together 4 times the value of the first Heap, but when you put the Cup by the second Heap, they are together double the value of the first Heap, I demand how many Crowns there were in each Heap? *Ans.* 50 and 30.

49. Three Merchants made a Company, A put in 150l. for 14 Months, B put in a certain Sum for 1 Year, and C put in 100l. for a certain Time; some Time afterwards they find that their Stock and Profit together made 475l. of which A took 195l. B 153l. and C. 127l. I demand how much B put in, and how long Time C's Stock was in? *Ans.* B put in $121\frac{3}{4}$ l. and C's Stock was in Company for $12\frac{3}{4}$ Months.

50. A Fountain has 4 Cocks. A, B, C, D, and under the Fountain stands a Cistern which can be filled by the Cock A in 6 Hours, by B in 8, by C in 10, and by D in 12 Hours; now the Cistern has 4 Holes, as E, F, G, H, and can be emptied by the Hole E, in 6 Hours, by F in 5, by G in 4, and by H in 3 Hours: Suppose then the Cistern to be full of Water, and that all the Cocks and Holes were let run together, I demand in what time the Cistern would be empty? *Ans.* In $2\frac{2}{5}$ Hours.

IN-

INSTRUCTIONS

FOR

BOOK-KEEPING.

QUESTION I.

HOW many Ways of dealing on Merchandize are there?

A. Three; *viz.* First on one's own Account.
Second, on Commission.
Third in Company.

Q. What doth Merchants Business consist in?

A. first, in buying and selling.
Second, in paying and receiving.
Third, in drawing and remitting.
Fourth, in sending Goods abroad, and receiving Goods from abroad.
Fifth, in insuring and getting Goods insured.
Sixth, in giving and receiving Interest, Mortgage and Bottomry.

Q. What is the first Thing to be done in order to keep your Books after the *Italian* Manner?

A. I must take the Inventory, or State of all that I have in the World, that is, Money, Effects, Debts, &c. which I must add up to know the total Sum: Next, I must set down what I am indebted to others, and if I take this last Sum from the first, the Remainder is what I am worth.

Q. How will you state in your Journal the Amount of the inventory of your Effects?

A. If

A. I must make every thing in particular, which I have, Debtor to Stock, that is to myself, as per Example,

Sundry Accounts Debt. to Stock, £. 7393 : 19 : 6
viz.

Cash, for so much I have in divers Species,	}	1345. 10 : 0
House in <i>Broad-street</i> , for so much it cost me,		
Ship the <i>Neptune</i> , for so much she stands me in,	}	765 : 00 : 0
Lands in <i>Imakilly</i> worth,		
<i>Peter Lepper</i> of London (*HA) for Ballance of Account,	}	367 : 04 : 0
Voyage to <i>Hamburgh</i> , for 400 Casks of Butter in the Hands of <i>John Rougier</i> ,		
Tobacco for 12 Hhds. net 6842l. at 9d. per lb. is,	}	256 : 11 : 6
Wool. for 9 Bags, 207 Stone, at 11s. 6d. per Stone,		
Beef for 500 Barrels at 20s. per Barrel,	}	500 : 00 : 0
Hides, for 300 ps. 200 Ct. 3qrs. olb at 18s. per Ct.		
		£. 7393 : 19 : 6

Q. How would you state the second Part of your Inventory, that is, what you are Indebted to others?

A. I must make Stock, that is myself, Debtor to sundry Accounts, *i. e.* to every one in particular that I am indebted to, as per Example.

Stock Debtor to Sundry Accounts, £. 1592 : 15 : 1
for so much I find myself indebted to the following Persons, viz.

To

* For H A read Account, and for M A my Account,

To <i>Arnold Jacob</i> , his Account of Interest.	} 500 : 00 : 0
To ditto, his account current, for half a Year's Interest,	} 20 : 00 : 0
To <i>J. Harrinbock</i> for ballance of Accounts,	} 104 : 00 : 0
To <i>Abraham Deveer</i> of Rotterdam, (MA) 1000 Guilders, which I value at 2s. each, is	} 100 : 00 : 0
To <i>Abraham Richardson</i> of Lisbon, (MA) 1100 $\mathfrak{D}$ and 400 Res, which I value at 6s. per Milre,	} 330 : 02 : 4
To <i>Anthony Dewit</i> of Bristol, (MA)	116 : 00 : 0
To <i>Abraham Saunders</i> of Limerick,	150 : 00 : 0
To <i>Samuel de la Fontain</i> of Rochell, (MA) 3849 Livres, which I value at 17d. make,	} 272 : 12 : 9

£. 1592 : 15 : 1

OF BUYING and SELLING.

Q. When you buy Goods for Ready-Money ?

A. Such Goods naming them, must be made Debtor to Cash.

Q. When you buy Goods upon Time ?

A. The Goods must be Debtor to the Person you bought them from.

Q. When you buy half for Ready Money, and half payable upon Time ?

A. The Goods Debtor to the Person I bought them from for the whole Sum, and afterwards I make the Person from whom I bought the Goods, Debtor to Cash for the Money I paid him; or thus, I make the Goods Debtor to sundry Accounts, viz. To cash for one half, and to the Person I bought them from for the other half.

Q. When you sell Goods for Ready Money ?

A. Cash

A. Cash must be Debtor to the Goods sold.

Q. When you sell Goods upon time?

A. The Buyer Debtor to the Goods sold.

Q. When you sell Goods for one half ready Money, and the other half upon Time?

A. The Buyer Debtor to the Goods for the whole Cost, and Cash Debtor to the Person that bought them for the Money received; or thus, sundry Accounts Debtor to the Goods sold, viz. Cash for the Money received, and the Person who bought them for the Remainder.

Of receiving GOODS from abroad, and sending GOODS abroad.

Q. When you sell Goods which belong to another Person abroad?

A. I make the Person or Persons, to whom I sell, Debtor to Goods belonging to such a one.

Q. When you have sold all the Goods which did belong to your Friend, what must be done then?

A. First, I must see what Charges I have laid out on them; I must also cast up my Commission at $2\frac{1}{2}$ per Cent, or according to the Country where I am, both which Sums I must subtract from the Produce of the Goods, and the Remainder I call the nett Produce, which belong to the Person, whose Goods they are, then I must write in my Journal as follows:

Goods belonging to such a Person, Debtor to sundry Accounts, viz.

To Cash for Duty, Freight, Cellerage,
&c. — — — £.

To Profit and Loss for my Commission £.

To the Owner for the nett Proceeds due
to him — — — £.

Q. When you send Goods abroad for your own Account, suppose to *Rotterdam*?

A. I must make a Voyage to *Rotterdam* Debtor to sundry Accounts, viz.

To the Goods I ship off for the Cost of them,	-	-	£.
To Cash for Duty, &c.	-	-	£.

Q. When your Correspondent sends you an Account of Sales for the Goods you sent him?

A. I must make the Person that sold them M. A. Debtor to Voyage to *Rotterdam*, for the nett Proceeds according to his Account of Sale, which Proceeds, if they be in the Money of the Country where he lives, I must reduce (according to the current Exchange) to the Value of the Money of the country where I am.

Q. When your Correspondent has, by your Order, and for your Account bought and shipped Goods?

A. I must make Voyage from such a place Debtor to him that bought and shipped them, M. A. for the whole Cost and Charges, according to his Account, which if it be in foreign Money, I must reduce to the Money of the country where I am, according to the current course of Exchange.

Q. When you ship off Goods for another Man's Account?

A. He for whose Account I ship them, H. A. must be Debtor to sundry Accounts, viz

To Goods for the Cost thereof,	£.
To Cash for the Duty, &c.	£.
To Profit and Loss for my Commission	£.

Q. When any Body sends you Goods from abroad, half for his, and half for your Account?

A. Voyage

A. Voyage from such a place, in company with such a one, Debtor to him that sent the Goods M. A. for half the Amount, which, if it be in foreign Money, must be reduced (at the current Exchange) in the Money of the country where I am.

Q. When you sell any of the aforesaid Goods on Trust?

A. He that buys them is Debtor to Voyage from such a place, in Company with such a one.

Q. When all the Goods in Company aforesaid are sold?

A. Voyage from such a Place, in Company with such a one, Debtor to sundry Accounts, viz.

To Cash for Duty, Cellerage, &c. £.

To Profit and Loss for my Commission £.

To my Partner, H. A. for half the }
nett Proceeds, - - - } £.

To Voyage from such a Place, in }
Company with such a one, for } £.
my half nett Proceeds, - - }

Q. When you ship Goods, half on your own Account, and half on another Man's Account?

A. Sundry Accounts Debtor to sundry Accounts, viz.

He that is half concerned in the }
Cargo, for his half, - - - } £.

Voyage to such a Place for my half, £.

To the Goods for the Cost thereof, £.

To Cash for Duty, &c. - - £.

To Profit and Loss for my Commission £.

OF DRAWING and REMITTING.

Q. What do the words Drawing and Remitting signify?

A. Drawing, is to write a Bill of Exchange, wherein I order a Person to pay a certain Sum to another Person. Remitting, is when I buy a Bill of Exchange, and send it to another Person to receive the Contents thereof.

Q. When you draw on any body for your Account?

A. If I receive the Value, that is, Money, for the Bill, then I must make Cash Debtor to him on whom, or for whose Account I draw M. A. but if I do not receive the Money, then the Person to whom I give the Bill is Debtor to him, for whose Account I draw M. A.

Q. When you draw on any Body for H. A. and receive Value?

A. Cash Debtor to him on whom I draw H. A.

Q. When you draw on any Body for H. A. and remit the Bill to another to be negotiated for your Account?

A. I must make Account of Exchange Debtor to the Person drawn on for the Sum.

Q. When you draw on any Body for your Account, and send or remit the Bill to another Person for your Account?

A. He to whom I remit the Bill, M. A. Debtor to him on whom I draw the same M. A.

Q. When you draw on any Body for your Account, and remit the Bill to another for his Account?

A. He to whom I remit the Bill, H. A. Debtor to the Person on whom I draw the same M. A.

Q. When any Body draws on you for your Account, and you pay the Money?

A. He that draws on me, or orders to be drawn on me, M. A. Debtor to Cash.

Q. When any Body draws on you for his Account, and you pay the Money?

A. He that draws on me, or orders to be drawn on me, H. A. Debtor Cash.

Q. When

Q When your Correspondent draws on another for your Account?

A. The Drawer M. A. Debtor to him on whom he draws, M. A.

Q When you draw on any body for your Account, and the Bill is protested for non-payment, and another accepts and pays the Bill for your Honour and for Account?

A. He on whom I have drawn the Bill, M. A. Debtor to him who accepts and pays the same, M. A.

Q When you draw on any Body for Account of another Person, and you receive the Value?

A. Cash Debtor to him for whose Account I draw H. A.

Q When any Body draws on you for Account of another Person, and you pay the Value?

A. He for whose Account the Bill is drawn, H. A. Debtor to Cash.

Q When you have drawn on any Body for your Account and the Bill is sent back with protest for want of Acceptance or Payment, and you reimburse or pay the Money with the Re-exchange, and other charges of protesting, &c.

A. Sundry Accounts Debtor to Cash, viz.

He to whom I have drawn the Bill for	} £.
the Principal Sum, -	

Profit and Loss for Re-exchange and	} £.
other Charges, -	

Q When you have drawn on any Body for H. A. or for Account of another, and he lets the Bill be protested, and another Person accepts the same, and pays it for your Honour?

A. He on whom or for whose Account the Bill was drawn, H. A. Debtor to him that accepts or pays the Bill, M. A.

Q Suppose the Bill comes back with Protest, and you reimburse the Money?

A. He for whose Account the Bill was drawn,
H. A. Debtor to Cash, for the principal and other Charges.

Q. When any Body draws on another Person for your Account, and the Bill comes back protested for want of Acceptance and Payment?

A. He on whom the Bill was drawn, *M. A.* Debtor to him that drew the Bill, *M. A.*

Q. When you take a Bill of Exchange to dispose of again?

A. Account of Exchange Debtor to Cash.

Q. But suppose you remit the Bill of Exchange to another Person for your Account?

A. He to whom I remit the Bill, *M. A.* Debtor to Cash; but if I send the Bill to any Body for another Man's Account, he for whose Account I remit the Bill, his Account Debtor to Cash.

Q. When you negotiate or sell Bills which you have kept for your own Account?

A. Cash Debtor to Account of Exchange.

OF REMITTING.

Q. When any Body remits you for your Account?

A. Cash debtor to him that remits me *M. A.* and if it is for *H. A.* then Cash is Debtor to him that remits me *H. A.* and if it is for another Man's Account, then Cash is Debtor to him for whose Account it is remitted *H. A.*

Q. When any Body remits another for your Account?

A. He to whom the Bill is remitted, *M. A.* Debtor to him that remitted the Bill, *M. A.*

Q. When any Body remits you for your Account, and the Bill is payable in another Town or County, and you send the Bill to your Friend to receive it there for you?

A. If I send the Bill for my Account, he to whom I send

I send it M. A. Debtor to him that remitted the Bill, M. A.

Q. when you remit any Body a Bill for your Account, and the Bill comes back protested, and he that gave you the Bill returns you the Money?

A. Cash Debtor to sundry Accounts, viz.

To him to whom the Bill was remitted, M. A.

To Profit and Loss for the Re-exchange.

Q. When you have remitted to any Body for his Account, and the Bill comes back protested, and you are re-imburfed for the Bill and Charges?

A. Cash Debtor to him to whom I had remitted the Bill, H. A.

OF INSURANCE.

Insuring, is to be responsible for a certain Sum of Money, which one has insured upon Effects or Goods which another has sent abroad, or otherwise, and to pay that Sum, in Case the Ship, in which the Goods were laden, happened to be taken by an Enemy, or cast away; as per Example: Suppose I had sent some Goods to sea, and had no mind to run the Risque of their being either taken or lost, then I agree with some Person to insure me a certain Sum of Money on those Goods, paying him 4, 5, or 6, &c. per Cent. more or less, according as the Voyage is dangerous or long, which Sum is called Præmium; which I pay to him that insures me, as soon as he has signed me an Instrument or Paper, which is called a Policy, by which the Insurer is liable to all Accidents or Damages, which may befall the Goods during the Voyage, but if the Ship arrives safe the Præmium remains in the Hands of the Insurer; and in Case the same Goods happened to be lost or taken by the Enemy, then the Insurer is obliged to pay me the Sum which he had insured me.

Q. When

Q. When you get Goods insured for your Account, and pay the Præmium?

A. The Goods or Voyage Debtor to Cash for the Præmium Policy, &c.

Q. When the Goods that were insured are lost, and the Insurer pays you the Insurance Money?

A. Cash Debtor to Voyage, or to the Goods that were insured.

Q. When you insure to another, and you receive the Præmium?

A. Cash Debtor to Account of Insurance.

Q. When the Goods insured are cast away, or taken by the Enemy, and you pay the Money insured?

A. Account of Insurance Debtor to Cash.

Q. When your Correspondent gets Insurance made for your Account?

A. The Voyage or Goods Debtor to him that got the Insurance made for me, M. A.

Q. When the Goods which your Correspondent had insured miscarry, and he receives the Money that was insured then?

A. The Correspondent, M. A. Debtor to Voyage or Goods insured.

Q. When you get Insurance made for another Man's Account?

A. He for whose Account I get Insurance made, H. A. Debtor to sundry Accounts, viz.

To Cash for the Præmium,	£.
To Cash for the Policy, &c. at half per Cent.	{ £.

To Profit and Loss for my Commission at two and a half per Cent	{ £.
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Q. When the Ship or Good which you got insured for another Man's Account, happen to be lost, and you receive the Money which was insured on them?

A. Cash Debtor to him for whose Account the Goods were insured, H. A. Of

Of B O T T O M R Y.

Bottomry is when a Master of a Ship borrows Money on the Bottom or Keel of a Ship, so as to forfeit the Ship itself to the Person who lends the Money, if it be not paid at the Time appointed after the Arrival of the Ship at the Port designed, with the Interest of 30, 40, or 50 per Cent. according as it is agreed upon? but if the Ship miscarry, the Lender loses his Money, and therefore the Interest is usually so great.

Q. When you lend Money on Bottomry?

A. Bottomry Account Debtor to Cash for the Principal.

Q. When the Ship arrives, and your Friend advises you that he has received both Principal and interest?

A. He who receives the Money M. A. Debtor to Bottomry Account for Principal and Interest.

Q. When it happens that the Ship is cast away, on which you lent the Money?

A. Profit and Loss Debtor to Bottomry Account.

Of I N T E R E S T.

Q. When you lend Money at Interest?

A. He to whom I lend the Money, H. A. of Interest Debtor to Cash.

Q. When you receive the Interest?

A. Cash Debtor to Profit and Loss.

Q. When you receive both Principal and Interest?

A. Cash Debtor to sundry Accounts, viz.

To such a Person his Account of Interest for the Principal, to Profit and Loss for the Interest.

Q. When you borrow Money at Interest?

A. Cash Debtor to him that lends the Money, H. A. of Interest.

Q. When you pay Interest?

A. Profit and Loss Debtor to Cash.

Q. When you pay Principal and Interest.

A, Sun-

A Sundry Accounts Debtor to Cash, viz.

He from whom I had the Money, H. A. of Interest for the Principal, and Profit and Loss for the Interest.

OF MORTGAGE.

To receive or give Money on Mortgage differs nothing from Money lent at Interest, but in this only, that for the Security of your Money you have Houses or Lands made over to you.

The Books in general used by Merchants are as follow, viz.

- | | |
|------------------------------|--------------------|
| 1. A Memorial or Waste Book, | } Principal Books. |
| 2. A Journal, | |
| 3. A Leger, | |
| 4. A Cash Book, | } Inferior Books. |
| 5. A Factor Book, | |
| 6. Charge Book. | |

The Number of Inferior Books cannot be lessened, but may be augmented.

Of the MEMORIAL and JOURNAL.

In the Memorial are written all the Affairs in general; with their circumstances one after the other, at the Time when they happen, which must be observed as exact as possible; for in Case of Disputes and Differences, they often refer to this Book, as being the Original of all other Books. In the Journal are inserted all the Articles which are in the Memorial, with their Difference, as in the following Examples, viz.

[A Memorial Article.]

Cork, 1st of January, 1792.

Sold to *Peter Clarke*, of this Town, 20 Hhds. of Tobacco. Weight 9465lb. at 9d. per Pound, payable 2d July next, - 354l. 18s. 9d.

[A Journal

[A Journal Article.]

Cork, 1st January, 1792.

Peter Clarke Debtor to Tobacco, 354l. 18s. 9d.
For 20 Hhds. sold him at 9d. per Pound, payable
2d July next, - - - 354l. 18s. 9d.

Now to post or bring the above Journal Article into the Ledger; first, you may in the Margin draw a Stroke thus $\frac{7}{}$, above which is put a Figure, shewing the Folio of the Ledger, where *Peter Clarke* has H. A. which is here Folio 9, and underneath is put the 7, shewing where Tobacco Account is in your Ledger, and when you have posted it, that is, having made *Peter Clarke* Debtor in the Ledger, and given Tobacco Credit, put a Mark or Punct thus (✓) before each Figure, which signifies that the Article is entered or posted in the Ledger.

Of the L E D G E R.

The Debtor Side of the Account of Stock, shews what you are indebted, and the Credit Side shews what is owing to you, and the Difference between them is what you are really worth, the Debtor Side of Account of Cash, shews what Money you have received; and the Credit Side shews what Money you have paid, and the Difference is what you have in Cash.

All that is in the Debtor Side of the Account of Persons, is what they are indebted to you; and all that is in the Credit Side is what you are answerable for to them; the Debtor Side of the Account of Merchandizes, shews what Quantity you have bought, and what they cost; and the Credit Side shews how you have disposed of them and their Produce.

In the Debtor Side of Profit and Loss, stands all you lose; and in the Credit Side stands all you have gained

gained. In general, all that is in the Debtor Side of the Ledger, except the Account of Stock, Profit and Loss, and such like, is what is due to you, or what you may call your own; and all that is in the Credit Side, is what you owe to others, or what you are answerable to them for.

Of the C A S H B O O K.

The Cash Book is also kept by Debtor and Creditor; on the Debtor Side you put all the Money you have received, from whom or for what, and on whose Account, and in what Species; in the Credit Side you put all the Money paid, to whom, for what, for whose Account, and in what Species.

Of the F A C T O R B O O K.

In the Factor Book are copied all the Invoices and Account of Sales whatsoever.

Of the C H A R G E S B O O K.

The Charges Book serves only for the Entry of all Manner of Charges, which are duly paid, as Porterage, Labourers, Boat Hire, Cellarages, &c. the total Sum of which at the end of every Month, is put down in the Memorial in one Article.

Of the B A L A N C E.

When your Books are posted, pointed, and examined, you must add up all the Accounts in the Ledger; that is, sum up all the Debtor Sides, and the Credit Sides, and if the Totals agree, then your Books do balance; or thus, take the Difference of all the Accounts, whatever the Debtor exceeds the Creditor, and put them under one another: and also whatever the Credit Side exceeds the Debtor, and
put

put them also under one another, and if their Totals are alike, your Books do balance.

Of PROFIT and LOSS.

The Accounts by which you can be a Gainer or a Loser, are viz. Accounts of Merchandizes, Voyages, or Goods sent abroad, Account of Exchange, or such Account of Persons where the foreign Money is kept within the Lines. Now to know what you have gained or lost by any Account of Merchandizes, add up in the Debtor Side the Quantity of Casks, Bales, Weights or Measures, which you have bought; do the same in the Credit Side with what you have sold, and if you find as many Casks, Bales, Weights, or Measures, &c. in the Credit Side, as in the Debtor Side, that shews that the Goods you have bought are sold or otherwise disposed of; if the Money in the Credit Side exceeds that of the Debtor, that is what you have gained by the Goods, but if the Money in the Debtor exceeds that of the Creditor, the Difference is what you have lost by them. The same is to be observed in all Accounts of Voyages, Account of Insurance, Account of Exchange, or any Account whereby you may be either Gainer or Loser.

If any Man's Account, which is called my Account, balances in the foreign Money, that is the Money that is kept within-side of the Country Money where you live, then you owe nothing to him, nor he to you; but if the Debtor of the outside Money, that is, the Money of the Country where you are, exceeds the Creditor, so much is lost in the Difference of Exchange; and if the Creditor exceeds the Debtor, so much is got by it.

Having thus examined the several Accounts, and noted their Profits and Losses on a Piece of Paper,

Z

then

then write in your Journal thus : Profit and Loss Debtor to sundry Accounts, that is, to every one of those Accounts in particular, for as much as you have lost by them, and make sundry Accounts that is, every one of those Accounts you have got Profit, by, Debtor to Profit and Loss.

All those Accounts being posted and closed in the Ledger, you must add up your Account of Profit and Loss in the Ledger, and whatsoever the Creditor exceeds the Debtor is clear Profit, or what your Stock is increased, for which Sum you must make Profit and Loss Debtor to Stock ; but if the Debtor exceeds the Creditor, that is, what you have lost, and your Stock is so much diminished, for such Sum you must make Stock Debtor to Profit and Loss.

ADVICE to a Young MERCHANT.

Whatsoever you take in Hand, or do, be sure you deal justly by all Men ; for ill gotten Goods seldom prosper long. Be not too hasty to be over rich, for that oftentimes brings one to poverty. Be not too greedy of falling into much Business, for great Merchandizes make a Man either rich or poor soon. Rob not the King of his Custom, for many Times a Pound that Way gotten costs ten. Trade not in deceitful, unmerchantable false Wares. Keep just Weights, equal Balance, and lawful Measures. Take good Notice of all you receive in and pay out in the Way of your Trade. Keep your Books and Accounts exact and in good Order, for therein consisteth the Credit of a Merchant. Be often perusing your Books, to acquaint yourself with your Estate, for many through Neglect in that have not only been undone, but greatly disgraced. Adventure no more at any Time than, that if you lose you can bear ; make your Adventure in many Parcels, that
if

if one fail, the others perhaps, may help up the Loss. Take Heed with whom you deal, and whom you trust; trust no Man till you have tried him first. Seek not, without great Necessity, to be credited by others, for the more you trade on your Stock, the less Care and more Honour you have. Be not lightly Security for others, for many thereby suffer Damages; neither lightly desire any to be Security for you, for one good Turn requires another. What you have once promised, be careful to perform, for Merchants may suffer by not keeping their Word. Therefore when you have payments to make, provide in Time, and have the Sums and Days in continual Remembrance. Be as careful as possible not to trade above your Stock.

Leave not your Business too much to another, but have a continual Oversight of it yourself. Live not in Fashion either above or inferior to your Rank, but keep in a middle Way. Love more your Reputation than your Riches; when you have gained, praise God, and remember the Poor. Be not prodigal, for that is wasting, nor yet niggardly, for that is base. Keep still a noble, generous Mind, guided by a good Understanding. Have a certain ordinary Time of being at home and miss no Man, if it be possible, at the time appointed. Frequent the Exchange and other Meeting Places of Merchants, for Absence makes a Man sometimes suspected. If you deal for others, do for them as for yourself, you thereby gain Friends, and Reputation. Be sure you follow the Orders you receive from your Correspondents punctually. Settle often with those you deal with, for short Accounts make long Friends. Let your Letters be concise and to the Purpose, free from quaint and studied Expressions; there ought to be nothing obscure or superfluous in them, or any affected Abbreviations, for all the Orders and Circum-

stances of Trade are plainly to be delivered. Tell your Correspondent in Plain Terms what you would have done for you, and what you are to do or have done for him.



THE DIGNITY of TRADE in *Great Britain and Ireland*: Extracted from the MERCANTILE LIBRARY, or COMPLETE ENGLISH TRADESMAN.

IS not Trade the inexhaustible Fund of all Funds, and upon which the Rest depend? Trade is the readiest Way for Men to raise their Fortunes and Families; and therefore it is a Field for Men of Figure and good Families to encounter upon.

By Trade we must be understood to include Navigation and foreign Discoveries, because they are generally speaking, all promoted and carried on by Trade, and even by Tradesmen, as well as Merchants; and the Tradesmen, as Owners, are at this Time as much concerned in Shipping as the Merchants, only the latter may be said to be the chief Employers of the Shipping,

Having thus done a particular Piece of Justice to ourselves in the Value we put upon Trade and Tradesmen in *England*, it reflects very much upon the Understanding of those refined Heads, who pretend to depreciate that Part of the Nation which is so infinitely superior in Wealth to the Families who call themselves Gentry, and so infinitely more numerous.

As is the Trade, so in Proportion are the Tradesmen; and how wealthy are Tradesmen in almost all the several Parts of *England*, as well as in *London*? How common is it to see a Tradesman go off the Stage, even but from mere Shop-keeping, with from ten to forty Thousand Pounds Estate, to divide among

mong his Family ? When, on the contrary take the Gentry in *England*, from one End to the other, except a very few here and there, what with excessive high living, which is of late grown into a Disease, and the other ordinary Circumstances of Families, we find few families of the lower Gentry, that is to say, from six or seven Hundred a Year, downwards, but what are in Debt, and in necessitous Circumstances, and a great many of greater Estates also.

On the other Hand, let any one who is acquainted with *England*, look but abroad into the several Counties, especially near *London*, or within fifty Miles of it, how are the ancient Families worn out by Time, and Family Misfortunes, and the Estates possessed by a new Race of Tradesmen, grown up into Families of Gentry, and established by the immense Wealth gained, as I may say, behind the Counter ; that is, in the Shop, the Ware-house and the Compting-house !

In how superior a Port or Figure (as we now call it) do our Tradesmen live, to what the middle Gentry either do or can support ? An ordinary Tradesman now, not in the City only, but the Country, shall spend more Money by the Year, than a Gentleman of four or five hundred pounds a Year can do, and shall increase and lay up every Year too ; whereas the Gentleman shall at the best, stand stock still just where he began, nay, perhaps, decline : and as for the lower Gentry, from an hundred Pounds a Year to three hundred or thereabouts, *though they are often as proud and high in their appearance as the other* ; as to them. I say, a Shoemaker in *London* shall keep a better House, spend more Money, cloath his Family better, and yet grow rich too. It is evident where the Difference lies ; an *Estate's a Pond*, but *Trade's a Spring* : the first, if it

keeps full, and the Water wholesome, by the ordinary Supplies and Drains from the neighbouring Grounds, 'tis well, and 'tis all that is expected; but the other is an unexhausted *current*, which not only fills the *Pond*, and keep it *full*, but is continually *running over*, and fills all the *Lower Ponds* and *Places* about it.

This being the Case in *England*, and our Trade being so vastly great, it is no wonder that the Tradesmen in *England* fill the List of our Nobility and Gentry; no wonder that Gentlemen of the best Families marry Tradesmen's Daughters, and put their younger Sons apprentices to Tradesmen: and how often do these younger Sons come to buy the elder Son's Estates, and restore the Family, when the Elder, and Head of the House, proving rakish and extravagant, has wasted his Patrimony, and is obliged to make out the Blessing of *Israel's* Family, where the younger Son bought the Birth-right, and the Elder was doomed to serve him.

Trade is so far *here* from being inconsistent with a Gentleman, that in short, *Trade* in *England* makes Gentlemen, and has peopled this Nation with Gentlemen; for, after a Generation or two, the Tradesmen's Children, or at least their Grand Children, come to be as good Gentlemen, Statesmen, Parliament men, Privy counsellors, Judges, Bishops, and Noblemen, as those of the highest Birth, and the most ancient Families; as we have shewn. Nor do we find any Defect in either the Genius or Capacities of the Posterity of Tradesmen, rising from any Remains of mechanic Blood, which 'tis pretended should influence them: but all the Gallantry of Spirit, Greatness of Soul, and all the Generous Principles that can be found in any of the ancient Families whose Blood is the most untainted, as they call it, with the low Mixtures of Mechanic Race,
are

are found in these, and, it is said before, they generally go beyond them in Knowledge of the World. which is the best Education.

To bring this Home to the Ladies, who are scandalized at that mean Step, as they call it, of marrying a Tradesman, it may be told them, for their Humiliation, that, however they think fit to act, sometimes those Tradesmen come of better Families than their own; and oftentimes, when they have refused them to their Loss, those very Tradesmen have married Ladies of superior Fortune to them, and have raised Families of their own, who, in one Generation, have been superior to those nice Ladies both in Dignity and Estate; and have, to their great Mortification, been ranked above them upon all public occasions.

The word *Tradesman* in *England*, does not sound so harsh as it does in other counties; and to say a *Gentleman Tradesman*, is not so much Nonsense as some People would persuade us to reckon it: and indeed, the very Name of an *English Tradesman*, will and does already obtain in the World; and as our Soldiers, by the late War, gained the Reputation of being some of the best Troops in the World; and our Seamen are at this Day, and very justly too, esteemed the best Sailors in the World: so the *English Tradesman* may be allowed to rank with the best Gentlemen in *Europe*: and as the Prophet *Isaiah* said of the Merchants of *Tyre*, that her *Traffickers were the Honourable of the Earth*.

The Greatness of the *British Nation* is not owing to War and Conquests, to enlarging its Dominions by the Sword, or subjecting the People of other Countries to her Power; it is all owing to *Trade*, to the Increase of our Commerce at home, and the extending it abroad.

It

It is owing to *Trade*, that new Discoveries have been made in Lands unknown, and new Settlements and Plantations made, new Colonies planted, and new Governments made in the uninhabited Islands, and the uncultivated Continent of *America*; and those Plantings and Settlements have again enlarged and increased the Trade, and thereby the Wealth and Power of the Nation, by whom they were discovered and planted: we have not increased our Power, or the Number of our Subjects by subduing the Nations who possess those Countries and incorporating them into our own; but have intirely planted our Colonies, and peopled the Countries with our own Subjects, Natives of this Island; and, excepting the Negroes which we transport from *Africa* to *America*, as Slaves to work in the Sugar and Tocacco Plantations, all our Colonies, as well in the Islands as on the Continent of *America*, are entirely peopled from *Great Britain* and *Ireland*, and chiefly the former; the Natives have either removed farther up into the Country, or by their own folly and treachery and engaging

What is it but *Trade*, the increase of Business at Home, and the employment of the Poor in Business and Manufactures of the Kingdom, by which the Poor get so good Wages, and live so well that they will not enlist for Soldiers, and have so good Pay in the Merchants Service, that they will not serve on Board the Ships of War, unless they are forced to do it?

The inland Trade of *England* is a Thing not easily described; it would in a Word, take up a whole Book by itself: it is the Foundation of our Wealth and Greatness; it is the Support of all our Foreign Trade, and of our Home Manufactures.

IN-

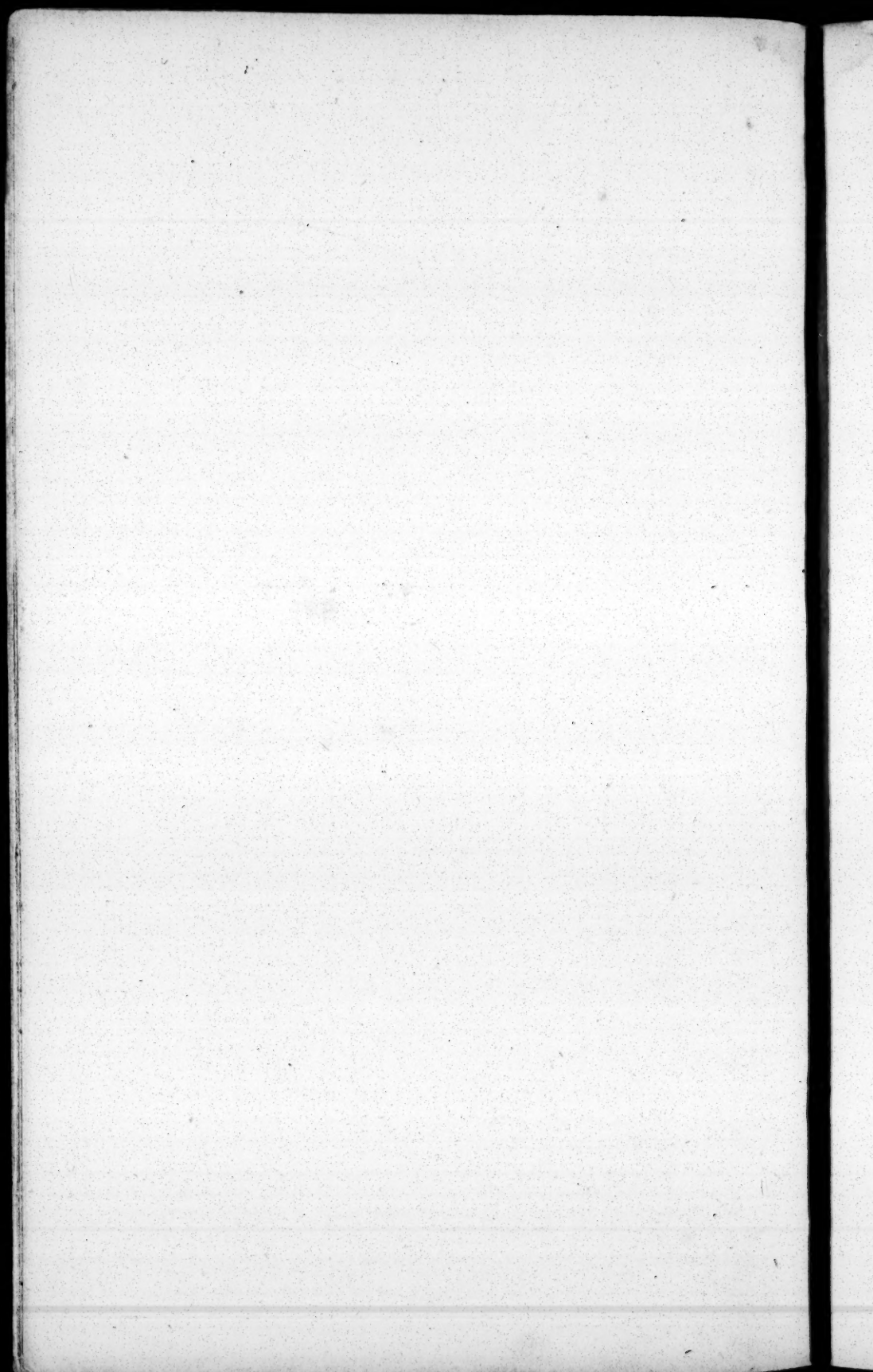
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FINIS.



APPENDIX OF ALGEBRA.

ALGEBRA, (or the great art) is a method of managing Arithmetical and Geometrical computations by letters, by means whereof any question may be clearly solved, and curious theorems deduced for solving all questions wherein numbers or lines are concerned, which would be in vain to attempt either by Arithmetic or Geometry.

The Characters or Signs generally used in Arithmetic not being explained in the foregoing treatise are introduced here, together with others peculiar to Algebra, viz.

- + Plus or more, is the mark of addition.
- Minus or less, is the sign of Subtraction.
- × Into, or the mark of multiplication.
- ÷ The mark of division.
- = Is the mark of equality.
- : : : Are the marks of proportionality.
- x^2 The square of x or x squared.
- x^3 The Cube of x .
- x Any power of x .
- $\sqrt{\quad}$ = Any square root $\sqrt[3]{\quad}$ any Cube root.
- $\sqrt[n]{\quad}$ Any root at Pleasure.

Quantities that are unknown are represented by x, y, z and v , those which are known by a, b, c, d , &c.

Addition may be comprehended in one Case, provided the following Directions be well understood.

1. When Quantities are of the same Kind, whether they have co-efficients or not, add them together, and their Sum will be the Sum required; but if unlike, subtract the co-efficients (if any) and set down the difference with the Sign of the greater, + or — as the Question may require.

Example 1.

$$x + y + z$$

$$x + y + z$$

$$x + y + z$$

$$\text{Sum } 3x + 3y + 3z$$

Example 2.

$$3x - 4y + 2z$$

$$4x - y + 7z$$

$$6x - 9y + 6z$$

$$\text{Sum } 13x - 14y + 15z$$

N. B. Where no Sign is, the Sign + is understood.

Exam. 3. $x^2 - 4xy + 5y^2$

$$6x^2 + 9xy - 7y^2$$

$$-2x^2 - 3xy + 8y^2$$

$$\text{Sum } 5x^2 + 2xy + 6y^2$$

$$x^2 + 2xy + y^2$$

$$x^2 - 2xy + y^2$$

$$2x^2 + 2y^2$$

Subtraction may be performed by changing all the Terms that are to be subtracted — into + or + into — and then adding them together, and the Sum will be the Difference.

A a

Exam.

Exam. From $6x^2 - 7y + 4z$ Take $3x^2 - 9y + 6z$

$$\underline{3x^2 + 2y - 2z}$$

Exam. ax

bx

$$\underline{ax - bx}$$

$$4x^3 - 3y^2 + 4z$$

$$6x^3 - 9y^2 - 2z$$

$$\underline{-2x^3 + 6y^2 + 6z}$$

ax by

x—z

$$\underline{ax - by - x + z}$$

Multiplication is performed by one general Rule; observing that like Signs produce + and unlike—in the Product.

N. B. If the Quantities have co-efficients multiply them, if not, join the Letters like the Letters of a Word, observing to place the Sign + or — (as above) before them.

Exam. 1. Multiply x

—x

 x^6

by x

y

 y^8 Product x^2 |

| —xy

| x^6y^3 $x + y + z$ $x + y + z$ $x^2 + xy + xz$ $xy + y^2 + yz$ $xz + yz + z^2$

$$\underline{x^2 + 2xy + y^2 + 2xz + 2yz + z^2}$$
 $x^3 + y^3 + z^3$ $x^3 + y^3 + z^3$ $x^6 + x^3y^3 + x^3z^3$ $x^3y^3 + y^6 + y^3z^3$ $x^3z^3 + y^3z^3 + y^3z^6$

$$\underline{x^3 + 2x^3y^3 + y^6 + 2x^3z^3 + 2y^3z^3 + z^6}$$

N. B. The Addition of Exponents is the same as Multiplication of Quantities.

Multiply $x^6 + y^6$ by $x^6 + y^6$ $x^{12} + x^6y^6$ $-x^6y^6 - y^{12}$ $x^{12} - y^{12}$ $x^n + v^n$

n n

x —v

 $x^{2n} + x^n v^n$

n n 2n

—x v —v

 $x^{2n} - v^{2n}$

This

This last shews that the Rectangle or Product of the Sum and Difference of any two Quantities is equal to the Difference of their squares, which is very useful.

Division—may be performed by one general Rule, it being nothing but the Proof of Multiplication; and therefore if the Quantities in the Divisor have like Signs to those in the dividend, the Quotient will be Affirmative; but if unlike, it will be Negative.

Exam. 1. $x) xy + x(y + 1$

Exam 2. $xy) xy^2(y$ Exam. 3. $x^2) x^5(x^3$

Exam. $x + v) x^2 + 2xv + v^2, x + v$
 $x^2 + xv$

$xv + v^2$

$xv + v^2$

$x - v) x^4 - v^4(x^3 + x^2v + xv^2 + v^3$
 $x^4 - x^3v$

$+ x^3v - v^4$

$x^3v - x^2v^2$

$+ x^2v^2 - v^4$

$x^2v^2 - xv^3$

$+ xv^3 - v^4$

$xv^3 - v^4$

$x) -xv - xy(-v - y$

$x - y) x^2 - 2xy + y^2(x - y$

$x^2 - xy$

$-xy + y^2$

$-xy + y^2$

$x - v) x^5 - v^5(x^4 + x^3v + x^2v^2 + xv^3 + v^4$
 $xv^5 - x^4v$

$+ x^4v - v^5$

$x^4v - x^3v^2$

$+ x^3v^2 - v^5$

$x^3v^2 - x^2v^3$

$+ x^2v^3 - v^5$

$x^2v^3 - xv^4$

$+ xv^4 - v^5$

$xv^4 - v^5$

A a 2

Involution

Involution of Quantities is nothing but multiplying them continually together as the Power they are to be raised to—

Thus, $x \times x = x^2$ $x \times x = x^3$ &c.

Sir Isaac Newton has given the following rule for raising any Binomial to any Power.

Rule.

If the Index of the first Letter of any Term be multiplied into its own Co-efficient, and the Product be divided by the Number of Terms to that Place; the Quotient will be the Co-efficient of the next succeeding Term forward.

Required to raise $x+v$ to the 6th Power regularly up.

$$\sqrt{x+v}^2 = x^2 + 2xv + v^2 = \text{the Square}$$

$$\sqrt{x+v}^3 = x^3 + 3x^2v + 3xv^2 + v^3 = \text{the Cube}$$

$$\sqrt{x+v}^4 = x^4 + 4x^3v + 6x^2v^2 + 4xv^3 + v^4 = 4\text{th Power}$$

$$\sqrt{x+v}^5 = x^5 + 5x^4v + 10x^3v^2 + 10x^2v^3 + 5xv^4 + v^5 = 5\text{th Power.}$$

$$\sqrt{x+v}^6 = x^6 + 6x^5v + 15x^4v^2 + 20x^3v^3 + 10x^2v^4 + 4xv^5 + v^6 = 6\text{th Power. And so for as many Powers as you please.}$$

$$\sqrt{x-v}^2 = x^2 - 2xv + v^2$$

$$\sqrt{x-v}^3 = x^3 - 3x^2v + 3xv^2 - v^3$$

$$\sqrt{x-v}^4 = x^4 - 4x^3v + 6x^2v^2 - 4xv^3 + v^4$$

$$\sqrt{x-v}^5 = x^5 - 5x^4v + 10x^3v^2 - 10x^2v^3 + 5xv^4 - v^5$$

$$\sqrt{x-v}^6 = x^6 - 6x^5v + 15x^4v^2 - 20x^3v^3 + 15x^2v^4 - 6xv^5 + v^6.$$

Note, All even Terms end with + and those that are odd with —

Evolution, or the Extraction of Roots being the reverse of Involution, or raising of Powers, is performed by converse Operations (viz) by the division of Indices, as Involution was by their Multiplication—Thus the square Root of x^6 .

$$= x^{\frac{6}{2}} = x^3 \text{ and } x^5 = x^{\frac{5}{2}} = \sqrt{x^5} \text{ and universally } nx = x^n$$

$$\sqrt{x^n} \text{ Required the Square Root of } x-3^2 \text{ it will be}$$

$$\sqrt{x-a^2} \mid \frac{1}{2}.$$

If the Cube Root of any Quantity were to be extracted, put the Radical Sign over the Quantity, with the Index 3 above the Radical, thus: the Cube Root of ax . will be

$$\sqrt[3]{ax} \mid \text{ of } x^{12} = x^{\frac{12}{3}} = x^4 \text{ and } x^n = x^{\frac{n}{3}}, \text{ \&c.}$$

Required the Cube Root of $x^3 - 3x^2y + 3xy^2 - y^3$. ∴

$$\sqrt[3]{x^3 - 3x^2y + 3xy^2 - y^3} = x - y.$$

See

See the Work

$$\begin{array}{r}
 x^3 - 3x^2y + 3xy^2 - y^3 \quad (x-y) \\
 x^3 \\
 \hline
 3x^2 - 3x^2y + 3xy^2 - y^3 \\
 - 3x^2y - \\
 + 3xy^2 - \\
 - y^3 \\
 \hline
 - 3x^2y + 3xy^2 - y^3
 \end{array}$$

N.B. As furd Quantities are not easily managed without the help of a Master, I thought it best to omit them.

Of Equations.

An Equation is when two equal Quantities, differently expressed, are compared together, by Means of the Sign = placed between them.

Thus, $9-4=5$ is an equation, expressing the Equality of the Quantities $9-4=5$

Equations are the means whereby we come at such Conclusions as to answer the Conditions of any Problem that maybe proposed; and this is called Reduction of Equations.

Reduction of Equations

Has sundry Rules, according as the Problem is proposed; therefore when a Problem is proposed, having but one unknown Quantity, it's called a single Equation, tho' before the Quantity can be cleared we must examine it whether it requires Addition, Subtraction, Multiplication, or Division, &c. And then having cleared the unknown Quantity, and brought it to one Side of the Equation, and all the known Quantities to the other, the Problem will be done by some of the above Rules.

Here follow a few Examples to illustrate the Rule. Note, Any Quantity may be transposed to either side of the Equation, by changing its Sign. Thus $x+6=14 \therefore x=14-6=8$ —And if $x-9=3 \therefore x=12$. Let $5x-9=4x+8$. Then it is plain $5x$ must be $=4x+17$ and by taking $4x$ out of both Sides of the Equation we have $x=17$.

Reduction where two or more unknown Quantities are concerned; find the value of any of them, and then compare them together, remembering to get as many Values of each unknown Quantity as you have Equations, otherwise it will be in vain to attempt the Solution of any Problem by any Learner.——Here follow a few Examples that will illustrate the whole.

$$\begin{array}{r|l} \text{Let} & 1 \quad 5x + 8y = 124 \\ - & 2 \quad 3x - 2y = 20 \\ 2 \times 4 & 3 \quad 12x - 8y = 80 \\ 1 \times 3 & 4 \quad 17x = 204 \end{array}$$

$$\begin{array}{r|l} - & 204 \\ 4 \div 17 & 5 \quad x = \frac{204}{17} = 12 \end{array}$$

$$\begin{array}{r|l} - & 6 \quad 15x - 10y = 100 \\ 2 \times 5 & 7 \quad 15x + 24y = 372 \\ 1 \times 3 & 8 \quad 34y = 272 \\ 7 - 6 & 9 \quad y = 8 \\ 8 \div 34 & \end{array}$$

Note, When you multiply any Equation by an absolute Number, you must dash the Figure as in Step the 3d, 5th, 7th, &c. to shew that they are not Steps multiplied together.

$$\text{Given } \begin{cases} 5x - 3v = 90 \\ 2x + 5v = 160 \end{cases}$$

Now in order to exterminate x , let the first Equation be multiplied by 2, and the second by 5, to make the Coefficients of x alike, there will arise the two following Equations, $10x - 6v = 180$

$$10x + 25v = 800$$

the first of which subtracted from the second, we have $31v = 620$ which Difference being divided by 31 the Co-efficient of v gives $v = 20$, then by transposing $6v$ in the first Equation we have $10x = 180 + 6v$ or $10x = 180 + 120 \therefore x = 30$.

$$\begin{array}{r|l} \text{Let} & 1 \quad x + y = 13 = a \\ & 2 \quad x + z = 14 = b \\ & 3 \quad y + z = 15 = d \\ 1 + 2 + 3 & 4 \quad 2x + 2y + 2z = 42 = a + b + d \\ & \quad \quad \quad a + b + d \\ -2 & 5 \quad x + y + z = 21 = \frac{a + b + d}{2} \\ & \quad \quad \quad a + b - d \\ 5 - 3 & 6 \quad x = \frac{a + d - b}{2} = 6 \\ & \quad \quad \quad a + d - b \\ 5 - 2 & 7 \quad y = \frac{a + b + d}{2} = 7 \\ & \quad \quad \quad a + b + d \\ 5 - 1 & 8 \quad z + \frac{a + b + d}{2} = 8 \end{array}$$

REDUCTION.

REDUCTION OF EQUATIONS.

If the Quantities of the Equation be fractional, make them on each side pure Fractions, then multiply them cross-wise and the Product may be reduced as before.

$$\text{Exam. } \frac{x}{3} = \frac{a}{3} \text{ then } x \times 3 = a \times 4. \therefore 3x = 4a. \text{ hence } x = \frac{4a}{3}$$

$$\text{Exam. } 2. \frac{x}{4} = \frac{x}{16} \therefore x^2 = 64 \text{ by extracting the Sq. Root on both sides of the Equation, we have } x = 8.$$

$$\text{Exam. } 3. \frac{x-b}{a} = \frac{b-x}{n}, \text{ which Equation being multiplied cross-wise, we have, } nx - nb = ab - ax, \text{ and by Transposition } ab + nb \text{ and Division, we have } x = \frac{ab + nb}{n + a}$$

When any Equation has a Radical Sign on one Side, the other Side must be raised to the same Dimension.

$$\text{Exam. } 1. \text{ Let } \sqrt{ax} = b, \text{ then by squaring } b, \text{ we take off the radical, and we have } ax = b^2, \text{ Now in order to find } x \text{ we must divide both sides of the Equation by } a. \therefore x = \frac{b^2}{a}, \text{ and so for any other.}$$

When a Problem hath two Dimensions, it cannot be answered by any of the Methods before laid down; and therefore we must have Recourse to some other Method; which is by completing the Square, and is performed by the following

Rule.

Add the Square of half the Co-efficient of the unknown quantity to both sides of the Equation, and the Square will be complete,

$$\text{Given } x^2 + 2ax = b \quad \text{Required } x.$$

First, let a be squared, and added as above; we have $x^2 + 2ax + a^2 = a^2 + b$, Then by extracting the root on both Sides of the Equation we have $x + a = \sqrt{a^2 + b}$ and by transposing a we have $x = \sqrt{a^2 + b} - a$.

OF PROBLEMS.

1. Problems are Questions to be solved.

2. The

2. The Solution of a Problem is, the answer to a Question, or the Determination of the quantity sought.

3. The Problem has oftentimes various Answers, and therefore it's necessary to know when it is truly limited; which may be know by the following

Rule.

When the Number of Quantities sought exceeds the Number of Equations given, the Question admits of various answers.

Suppose $x+y=20$ now it is plain, x may be any Number, whole or broken, being less than 20, and y the Remainder.

Rule.

When the Number of Quantities sought are equal to the Number of Equations (not depending on each other) the Question is truly limited.

Axioms for the more ready solving of Questions.

Ax. 1. If from the Sum of any two Quantities either Quantity be taken, the remainder is the other Quantity.

Ax. 2. The difference of any two Quantities being added to the less, the Sum is the greater.

Ax. 3. The Product of any two Quantities being divided by either Quantity, the Quotient is the other.

Ax. 4. The Quotient of any two Quantities being multiplied by the less, the Product is the greater.

Ax. 5. The Rectangle of the Sum and Difference of any two Quantities, is equal to the Difference of their Squares.

Ax. 6. The Difference of the Squares of the Sum and difference of any two Quantities, is equal four times their Rectangle.

Ax. 7. The Sum of the Squares of the Sum and Difference of any two Quantities is equal to twice the Sum of their Squares.

$x+y$ =Sum.

$x-y$ =Difference.

xy =Product.

x

$\frac{x}{y}$ =Quotient.

y

x^2+y^2 =Sum of the Squares.

x^2-y^2 =Difference of the Squares.

Note, The above being understood, any Problem may be easily taken in the Algebraic Method.

SOLUTION,

SOLUTION OF PROBLEMS.

Prob. 1. The Sum of Two Numbers being 14, and their difference 5, required the Numbers with a Theorem for all such Questions ?

$$\begin{array}{l|l}
 & \text{Let } 14=a, 5=b \text{ and } x=\text{less, then} \\
 & b+x \text{ will be the greater Number per Ax. 2,} \\
 1 & 2x+b=a \text{ P. Q.} \\
 & a-b \\
 1-\div & 2 \quad x=\frac{a-b}{2}=5 \\
 & b+x=9 \\
 & \text{N. B. I shall follow the above Numbers} \\
 & \text{for 10 Questions.}
 \end{array}$$

Prob. 2. The Sum of two Numbers $=2a$ and their Product

$$\begin{array}{l|l}
 & =p \text{ Required the Numbers ?} \\
 & x=\frac{1}{2} \text{ Difference of the Numbers } a+x=\text{greater} \\
 & a-x=\text{less} \\
 1 & a^2-x^2=p \\
 1+ & 2 \quad a^2-p=x^2 \\
 2\sqrt{} & 3 \quad x=\sqrt{a^2-p}=2 \therefore a+x=9, a-x=5
 \end{array}$$

Prob. 4. The Sum of two Numbers 14 (a) and their Quotient $q=\frac{5}{9}$ required the Numbers.

$$\begin{array}{l|l}
 & x=\text{less} \text{ \& } qx=\text{greater Number} \\
 1 & x+qx=a \text{ P. Q.} \\
 & a \\
 1 \div & 2 \quad x=\frac{a}{q+1}=5 \\
 & qx=9
 \end{array}$$

Prob. 4. The Sum of any two Numbers being 14, and the Sum of their Squares 106, required the Numbers ?

$$\begin{array}{l|l}
 & 14=2a, x=\frac{1}{2} \text{ Difference, } 106=b \\
 & a+x=\text{greater} \text{ \& } a-x=\text{less Number} \\
 1 & 2a^2+2x^2=b \\
 & b-2a^2 \\
 1-\div & 2 \quad \sqrt{x}=\frac{b-2a^2}{2} \\
 & \sqrt{b-2a^2} \\
 & x=\frac{\sqrt{b-2a^2}}{2}=2 \\
 2\sqrt{} & 3 \quad a+x=9 \\
 & a-x=5
 \end{array}$$

Prob. 5. The Sum of two Numbers 14, and the Difference of their Squares 56, required the Numbers ?

x=

$$\begin{array}{l|l}
 & x = \frac{1}{2} \text{ Differ. of the Numbers, } 14 = 2a, 56 = b \\
 & a + x = \text{greater } a - x = \text{less} \\
 1 & 4a = b \\
 & b \\
 1 \div & 2 \mid x = \frac{b}{4a} = 2 \\
 & 4a \\
 & a + x = 9; a - x = 5
 \end{array}$$

Prob. 6. The Difference of two Numbers 4, and their Product 45, required the Numbers?

$$\begin{array}{l|l}
 & x = \frac{1}{2} \text{ Sum, } 4 = 2a, 45 = b. \\
 & x + a = \text{greater, } x - a = \text{less} \\
 1 & x^2 - \frac{b}{4} \\
 & a^2 = \\
 1 + \sqrt{} & 2 \mid x = \sqrt{\frac{b}{4} + a^2} = 2 \\
 & x + a = 9 \\
 & x - a = 5
 \end{array}$$

Prob. 7. The difference of 2 Numbers being 4, and their quotient $\frac{9}{5}$ required the Numbers?

$$\begin{array}{l|l}
 & x = \text{less, } \frac{9}{5} = q, 4 = b \\
 & xq = \text{greater} \\
 1 & qx - x = b \\
 & b \\
 1 \div & 2 \mid x = \frac{b}{q-1} = 5 \\
 & q-1 \\
 & qx = 9
 \end{array}$$

Prob. 8. The Difference of two Numbers 4, and the Sum of their Squares 106 required the Numbers.

$$\begin{array}{l|l}
 & x = \frac{1}{2} \text{ Sum } 4 = 2a, 106 = b \\
 & x + a = \text{greater } x - a = \text{less} \\
 1 & 2x^2 + 2a^2 = b \\
 & \sqrt{b - 2a^2} \\
 1 - \div \sqrt{} & 2 \mid x = \frac{\sqrt{b - 2a^2}}{2} = 2 \\
 & x + a = 9; x - a = 5
 \end{array}$$

Prob. 9 The Sum of two Numbers 14, and the difference of their squares 56, required the Numbers?

$$\begin{array}{l|l}
 & 14 = 2a, 56 = b, x = \frac{1}{2} \text{ Difference} \\
 & a + x = \text{greater } a - x = \text{less} \\
 1 & 4ax = b \\
 & b \\
 1 \div & 2 \mid x = \frac{b}{4a} = 2 \\
 & a + x = 9 \\
 & a - x = 5
 \end{array}$$

Prob.

Prob. 10. The product of two Numbers being 45, and their Quotient $=\frac{9}{5}$ required the Numbers?

$$\begin{array}{r|l}
 1 \div \checkmark & \begin{array}{l} 45=b, \frac{9}{5}=q \\ x=\text{less}, qx=\text{greater.} \\ qx^2=b \\ \sqrt{b} \\ x=\frac{9}{5}=5 \\ q \\ qx=9 \end{array}
 \end{array}$$

Prob. 11. What two numbers are those whose Sum is 40, and Product only 4, with a theorem for all such Questions?

$$\begin{array}{r|l}
 1 + \checkmark & \begin{array}{l} \text{Let } 40=2a, x=\frac{1}{2} \text{ Differ. of the Numbers.} \\ \text{then } a+x=\text{greater \& } a-x \text{ less Number.} \\ a^2-x^2=4=b \\ a^2-b=x^2 \\ \sqrt{a^2-b}=19,899 \\ x= \\ a+x=39,899 \\ a-x=0, 100 \end{array}
 \end{array}$$

Prob. 12. Required two Numbers whose Product is 12 and the difference of their Squares 7?

$$\begin{array}{r|l}
 1 + \checkmark & \begin{array}{l} \sqrt{x}=\text{greater } \sqrt{y}=\text{less Number.} \\ \sqrt{xy}=12 \\ x-y=7 \\ xy=144 \\ xy=y^2=7y \\ y=144-7y \\ y^2+7y^2=144 \\ 7y^2+7y+\frac{49}{4}=144+\frac{49}{4} \\ \sqrt{144+\frac{49}{4}} \\ y+\frac{7}{2}=\frac{\sqrt{144+\frac{49}{4}}}{2} \\ y=9 \therefore \sqrt{y}=3 \& \sqrt{x}=4 \end{array}
 \end{array}$$

Prob. 13. A Gentleman being asked how many Guineas he had in his pocket? answered, if the Number I have be multiplied by 4, and the Square Root of the Product be added to the Number of Guineas I have in my pocket, that Sum will be equal 440, required the Number?

$$x^2=$$

$$\begin{array}{r|l}
 & x^2 = \text{the Guineas he had, then} \\
 1 & x^2 + 2x = 440 \text{ P. Q.} \\
 1 \square & 2 \quad x^2 + 2x + 1 = 441 \\
 2 \checkmark & 3 \quad x + 1 = 21 \\
 & 4 \quad x = 20 \therefore x^2 = 400
 \end{array}$$

Prob. 14. What Number is that which being divided into 4 or 5 equal parts, the Product of all the parts in both Cases shall be exactly the same.

$$\begin{array}{r|l}
 & x = \text{the Number. Then} \\
 & \begin{array}{ccccccccc} x & x & x & x & x & x & x & x & x \end{array} \\
 1 & \frac{x}{4} - \frac{x}{4} - \frac{x}{4} - \frac{x}{4} = \frac{x}{5} - \frac{x}{5} - \frac{x}{5} - \frac{x}{5} - \frac{x}{5} \text{ P. Q.} \\
 & \begin{array}{ccccccccc} 4 & 4 & 4 & 4 & 5 & 5 & 5 & 5 & 5 \end{array} \\
 & x^5 = x^4 \\
 \therefore & 2 \quad 3 \quad 125 \quad 256 \\
 2 \times & 3 \quad x = \frac{3125}{256} = 12 \frac{53}{656}
 \end{array}$$

Prob. 15. A Merchant ships Goods for Jamaica, to the Amount of £.500; pays for Insurance 5 per Cent. for prompt Payment 3 per Cent. how much money ought the Merchant to Insure, supposing the Goods to be lost, that he shall be no loser?

$$\begin{array}{r|l}
 & x = \text{the Sum to be insured then} \\
 & \frac{8x}{100} \\
 1 \times & 2 \quad 100x - 8x = 50000 \\
 & 50000 \\
 2 \div & 3 \quad x = \frac{50000}{92} = \text{£.543-9-6}\frac{3}{4}, \frac{13}{19}
 \end{array}$$

Prob. 16. You that are skilled in Mathematic Arts, Divide 100 into two such Parts, That when those Parts each other has divided, Their Quotients make just 5 if right decided?

Prob. 17. x shews the Years, and y the Months explain, Hence by a Quadratic you my age may gain.

F I N I S.



